

# BULLETIN No. 42

## The Lehigh Valley Railroad

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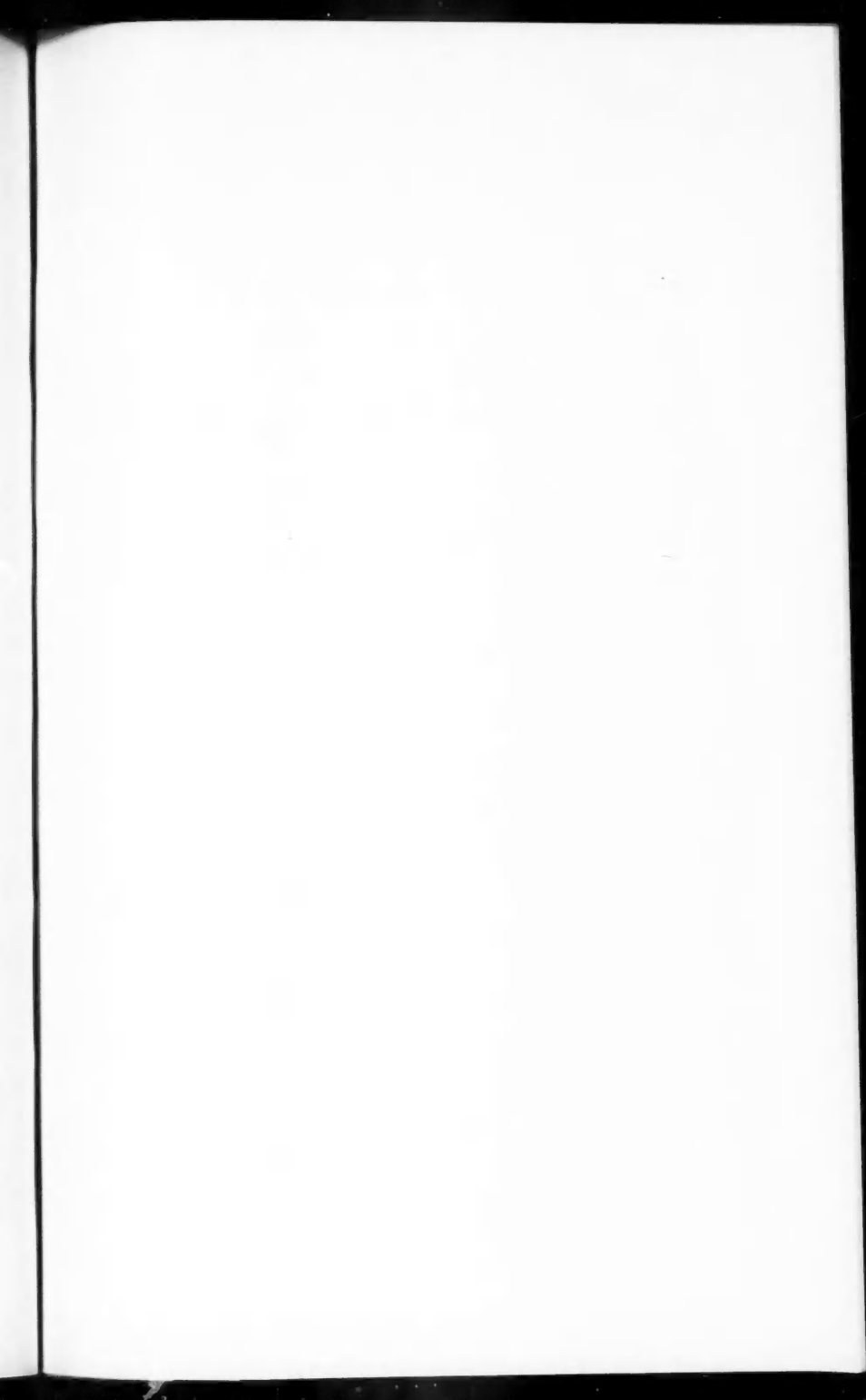
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One hundred years ago, in 1836 to be exact, the Beaver Meadow R. R. was opened for the transportation of passengers, merchandise and coal. The Beaver Meadow R. R. is now a part of the Lehigh Valley R. R., but it had the distinction of being the first steam road in Carbon County, Pennsylvania and is the oldest portion of the present Lehigh Valley System.

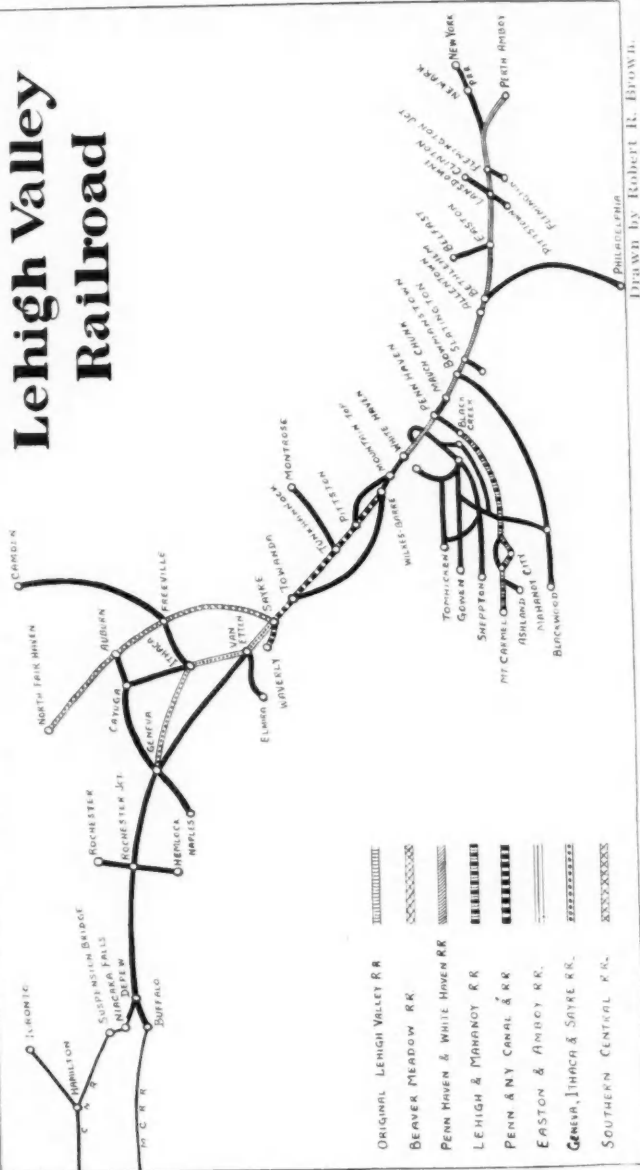
It is a long way from the tiny locomotives and  $3\frac{1}{2}$  ton coal cars to the giant "Wyoming" type and the huge gondola. These changes and developments have been made gradually, the same as has been done on all of our American railroads. The early impetus given this road by such men as Asa Packer, Robert H. Sayre and others has been retained to this day and the Lehigh Valley can easily take its place with any of our eastern trunk lines.

Your Editor wishes to express his appreciation to Mr. Kuhler for his cover design of a Mason locomotive with its coal train and to Mr. Clinton T. Andrews of Easton, Pennsylvania for his assistance in procuring the illustrations in this bulletin.





# Lehigh Valley Railroad



Drawn by Robert R. Brown.

# The Lehigh Valley Railroad

By CHAS. E. FISHER.

OF the many roads that traversed the coal regions of the State of Pennsylvania, one of the most interesting from an historical point is the Lehigh Valley Railroad. Like many of our early roads, it achieved success through the efforts of a few men which were identified with the enterprise from its inception.

The Lehigh Valley Railroad was the project of the Hon. Asa Packer and was the result of an act of the Legislature of Pennsylvania, approved April 21st, 1846. The incorporators were as follows: James M. Porter, A. H. Reeder, D. D. Wagener, Samuel Yohe, Jacob Able, Abraham Miller, P. S. Michler, Jacob Wolle and Henry Guetter of Northampton County; Peter Mickley, Casper Kleckner, Benjamin Ludwig, Christian Pretz, Peter Huber, William Edelman, Henry King and George Probst of Lehigh County; Asa Packer, Stephen Balliet, John D. Bowen and Thomas Craig of Carbon County; and F. W. Hughes, William Mortimer and Benjamin Heilner of Schuylkill County.

Any two of the above gentlemen may be appointed commissioners to do and perform the several things mentioned, that is to say: They shall on or before the first day of November next, procure three books, one of which shall be opened at Mrs. White's Hotel, in Easton, and one at the Pennsylvania Hall, in Pottsville, Schuylkill County; and one at the house now kept by George Haberacher, in Allentown, Lehigh County; in each of which they shall enter as follows: "We, whose names are hereunto subscribed, do promise to pay to the President and Managers of the Delaware, Lehigh, Schuylkill & Susquehanna Railroad Company the sum of fifty dollars for each share of stock set opposite to our respective names, in such manner and proportions and at such times as shall be determined by the President and Managers of the said company, in pursuance of an act of the General Assembly of this Commonwealth entitled 'An act to authorize the Governor to incorporate the Delaware, Lehigh, Schuylkill & Susquehanna Railroad Company.'" The act is signed by Findlet Patterson, Speaker of the House of Representatives; Daniel L. Sherwood, Speaker of the Senate. It was approved the twenty-first day of April, one thousand eight hundred and forty-six by Francis R. Shunk, Governor.

That the enterprise did not have clear sailing from the start is proven from the early records. The only item of importance that we can note that took place during the entire year of 1847 was a meeting of the Board of Managers held in Easton on October 21 at which James M. Porter was elected to the presidency. At another meeting of this board, held on January 8, 1848, we find the following—"No election held this day, the old officers remaining over. Signed, John N. Hutchinson, Secretary."

Now the first act stipulated that work on the road was to commence in three years time and that it was to be completed within seven years. On March 20, 1849 an act was passed granting an extension for the commencement of construction. On April 9, 1849 an act was passed and

approved, granting to this corporation immunity from the law requiring railroad companies to have a majority of their directors to be citizens resident of Pennsylvania. On the 11th day of March, the State of New Jersey concurred with the State of Pennsylvania and passed an act giving this corporation the power to build a bridge, for railroad purposes only, at or near Easton, crossing the Delaware River.

#### 1851

At the beginning of this year the determination to begin actual construction became strong. Requests were made to the Lehigh Coal & Navigation Company for the loan of two competent engineers appointed to view and report on the erection of bridges where the road crossed the canal of that company. On March 3rd, the Lehigh Coal & Navigation Company appointed Messrs. Jacob Dillinger and Jesse Samuels, who reported favorably and on March 10th actual grading was begun on the sixteenth mile from Delaware River. Releases from property owners were secured as fast as possible and the work progressed under Jacob Dillinger.

On March 10th of this year, at the meeting held on this date, James M. Porter was re-elected as President and Jno. N. Hutchinson as Secretary and Treasurer. The following gentlemen were elected from the stockholders as a Board of Managers: Christian Pretz of Allentown, Asa Packer of Mauch Chunk, Dudley S. Gregory of Jersey City, Benjamin Williamson of Elizabethtown, John N. Hutchinson of Philadelphia and Edward R. Biddle of New Jersey. Two important meetings were held on October 7 and 8, at which Mr. Packer's purchase of the controlling amount of stock was made known.

#### 1852

At the annual meeting held on January 2nd, Mr. James M. Porter was re-elected as President and Messrs. Porter, Pretz, Asa Packer, Robert Lockhart and Elisha A. Packer, Managers. Mr. Asa Packer was Secretary and Treasurer.

On May 11th, the Board ratified the appointment of Robert H. Sayre, a trusty lieutenant of Asa Packer as Chief Engineer. At this meeting Judge Packer proposed the construction of the road connecting with the Beaver Meadow Railroad at Mauch Chunk, Pa., to Phillipsburg, N. J. on the Delaware River, where it would intersect with the Central Railroad of New Jersey which had been completed from Jersey City as far west as White House and was being constructed to Phillipsburg, and the Belvidere-Delaware Railroad. This plan was accepted by the stockholders and plans were made to secure the right of way and bridge the rivers. The plan called for a single track railway but through the foresight of Asa Packer, it was decided at a later meeting to secure releases for a double track railway.

In August, 1852, Mr. Robert H. Sayre, Chief Engineer wrote to the President and Directors of the location and estimate of a railroad down the valley of the Lehigh to Easton. His report is so interesting that nearly all of it is produced herein.

"From the southern terminus of the Beaver Meadow Railroad, opposite Mauch Chunk to Parryville—a distance of 6 miles—the route will occupy the old Beaver

Meadow grade, portions of which will have to be raised and widened and other portions entirely renewed, having been swept away by the freshets, 1841, and subsequent washings. This part of the line will require about 30,000 dollars to put it in condition to receive the superstructure, exclusive of the bridges, across the Lehigh River and Mahoning Creek. From Parryville to the Gap, a distance of 6 miles, the route crosses several sandy flats (in the aggregate about 2 miles) which vary from 1 to 15 feet below grade. The balance of the distance, 4 miles, it runs along the base of the Blue Mountains, which is very steep and abrupt, and is composed of red shale rock and gravel, excellent materials for the roadbed.

"From the Gap to the head of Swartz's dam, a distance of 11 miles, the route crosses the slate formation, which in some places presents very abrupt and irregular points, rendering it rather expensive constructing the road. Sections 17, 18 and 19 include the heaviest portions. Sections 15, 16, 23 and 24 also pass over some precipitous bluffs. All the stone required for masonry upon this portion of the route will have to be transported from 1 to 5 miles. From this point to Allentown, a distance of 6 miles, the route crosses the limestone formation, some parts of the line pass valleys or flats requiring embankments, other portions elevated flats which need to be excavated, and steep bluffs of rock rising nearly perpendicular from the water's edge need deep cutting. From Allentown to Bethlehem, 5 miles, the route will occupy the site of the present public road a considerable portion of the distance; the rock upon this part of the line lies very near the surface and it is of an excellent quality for building purposes. Quarries can be opened at a trifling cost, from which fine large stone may be procured for bridge abutments and other masonry requisite along the line. From Bethlehem to South Easton, a distance of 11 miles, the route crosses flats requiring embankments, along the slope of hills, etc., limestone bluffs to be excavated, and for a considerable distance along the public road, the location of which will make a change of its location necessary. Through South Easton the route has not been entirely determined upon; between the street and the canal, however, would seem to be the proper place. The limestone, sandstone and red shale occurring on the line furnish good and cheap materials for the construction of the road, and, with the exception of that part of the route traversed by the slate, wherever stone are required, they can be procured without much expense.

"The location, though a preliminary one, is so near where the road must ultimately be made that I have based my estimate upon it. The limited time and assistance allotted me prevented my making a permanent location or taking such accurate measurements as I desired; yet as the line cannot be varied much the estimate will not be far from the true result. The curves in some instances may be eased at additional cost, but generally where the sharp curves occur there would be a large increase of expense incurred in making them much lighter owing to the steep precipitous bank. The curves with one exception are short—the longest on the route being 4,800 feet with a radius of 1,600 feet. The rest vary from 300 to 1,500 feet in length with radii of from 700 to 11,460 feet. Considerably more than half the distance will be straight lines, varying from 500 feet to 1½ miles in length. The grades are very favorable—the descent in all cases (except the mile at South Easton) being in the direction of the grade. The maximum grade is 45.4 feet per mile and that for only 4,000 feet, and this may be reduced to 30 feet without great additional cost. The grades upon the ground do not occur in the order exhibited in the table, but are divided along the route, so that generally the light grade follows a heavy one. The grades are as follows:

Descending	35.40 ft.	per	mile	for	0	miles	4,000 ft.
do	28.00 ft.	do	0	do	3,400 ft.		
do	21.10 ft.	do	3	do	160 ft.		
do	20.00 ft.	do	0	do	3,000 ft.		
do	18.30 ft.	do	0	do	2,600 ft.		
do	15.80 ft.	do	1	do	2,620 ft.		
do	14.80 ft.	do	0	do	3,000 ft.		
do	12.70 ft.	do	3	do	2,360 ft.		
do	11.60 ft.	do	3	do	360 ft.		
do	10.60 ft.	do	1	do	1,120 ft.		
do	9.10 ft.	do	1	do	220 ft.		

do	7.90 ft.	do	0	do	3,100 ft.
do	7.10 ft.	do	0	do	2,900 ft.
do	6.60 ft.	do	0	do	4,200 ft.
do	5.80 ft.	do	0	do	3,500 ft.
do	5.30 ft.	do	8	do	3,860 ft.
do	5.00 ft.	do	1	do	4,320 ft.
do	4.20 ft.	do	0	do	2,300 ft.
do	3.70 ft.	do	0	do	5,000 ft.
do	2.60 ft.	do	7	do	1,440 ft.
do	Level ft.	do	6	do	1,020 ft.
Ascending	18.5 ft.	do			5,200 ft.

through South Easton to the Delaware River. This grade may be avoided by intersection with the Trenton & Belvidere Road. The road is laid out for a single track 14 feet wide at the grade line on embankments, and 20 feet wide in common earth cuts. The slopes are generally one and one half in one, except in rock where they are 3 inches better per foot.

"The bridges and culverts are all calculated for a double track and the bridge across the Delaware can be so constructed as to admit four tracks, two of them on top, 60 feet above the river, to intersect the Central Railroad, and two underneath to intersect the Trenton and Belvidere Railroad. The masonry and other mechanical work is intended to be plain and cheap, but strong and durable. The superstructure estimated has a rail of 65 pounds to the yard, laid upon cross ties 30 inches apart from center to center.

"The estimate of the grading, masonry (except the bridge abutment and piers), changing of public roads and grubbing and clearing, is 821,695 dollars. The estimate of the superstructure, including four miles of turnouts, frogs and switches is 375,000 dollars. The depots and other buildings necessary for the early use of the road I have estimated at 35,390 dollars. The total expenditure under these four heads amounts to 1,430,853 dollars, to which must be added the estimate for land and damages. This is a matter that cannot be arrived at with any degree of accuracy without consulting personally each property holder, which I have neither had the time nor the opportunity of doing. I have, however, made an estimate of the probable amount of land that will be required for double track, and affixed such a price as I think will not fail to secure it.

"I place the amount at \$100,000, which added to the items above enumerated makes the total \$1,530,853. The prices are such as the work can be done for. I have averaged them as part of the work will cost less and part of it will probably cost more. In most places where embankment occurs there is not excavation sufficient to make it. The field work was commenced early in May (11th) and completed about the middle of June by our corps, under my immediate direction, since which time I have been engaged in the office making up the estimate which I now place before you.

"All of which is very respectfully submitted.

ROBT. H. SAYRE,

"Chief Engineer, Delaware, Lehigh, Schuylkill & Susquehanna Railroad."

#### 1853

On January 7th of this year, the name, style and title of the Delaware, Lehigh, Schuylkill & Susquehanna Railroad Company was, by a further supplement, changed; so that it should then be known as the Lehigh Valley Railroad Company, with all the rights, privileges and immunities of the former corporation. This was ratified at the annual meeting held on January 10th.

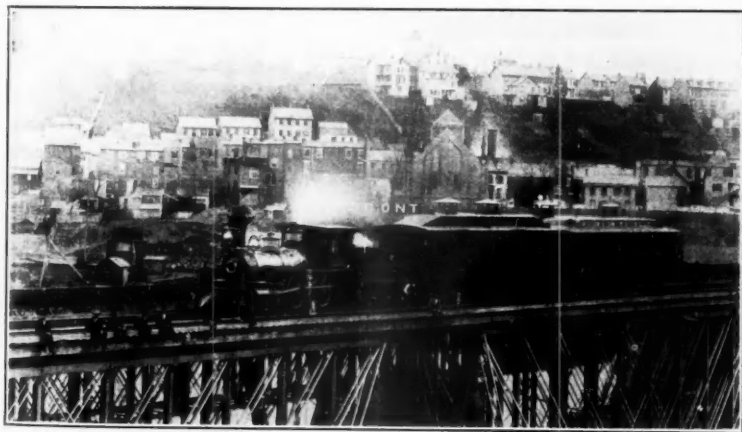
#### 1854

The Lehigh Coal & Navigation Company asked for an injunction preventing this company from encroaching upon its property. The President was given authority to resist any interference. On the 3rd of



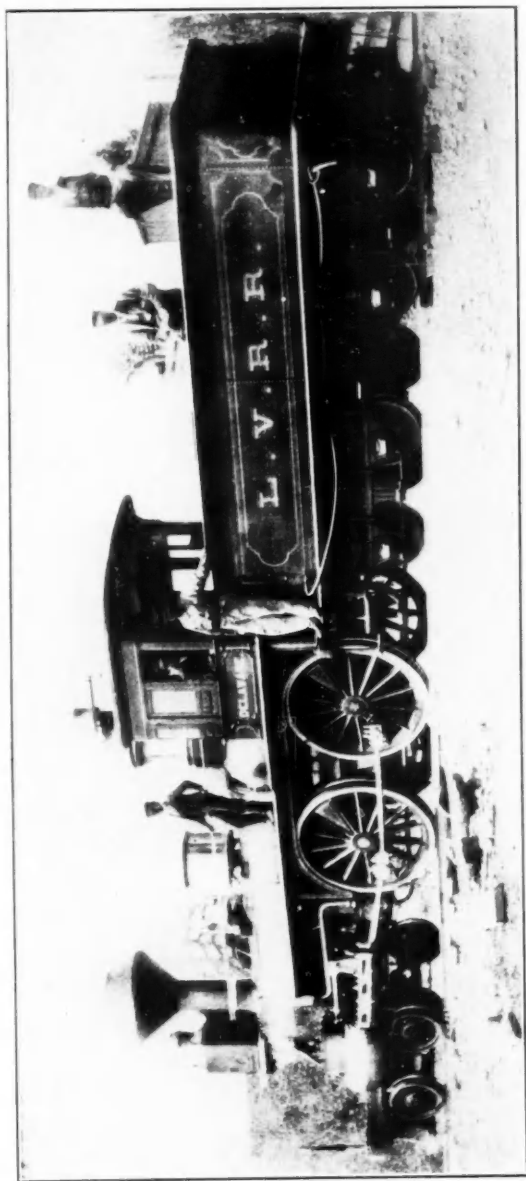
Courtesy of Clinton T. Andrews.

L. V. Bridge over Delaware River, Easton, Pa. Built 1855. Double Deck Wooden Bridge.  
N. J. C. Top. Bel. Del. Lower.



Courtesy of W. A. Lucas.

L. V. Train on Delaware River Bridge.



L. V. "Delaware"—Richard Norris & Son, 1855.

Courtesy of Dr. F. E. Sornborger.



March resolutions looking forward to an amicable solution of the troubles between the two companies were passed and this was eventually accomplished.

### 1855

The report of the company for this year contains a very interesting account of the building of the road by Robert H. Sayre, the Chief Engineer.

"In December, Section No. 46, including the heavy rock cut through Mount Ida, opposite Easton, together with the masonry for the bridge across the Delaware River was sublet to Messrs. Atwood, Cook & Co. About the same time Sections No. 7 and 8 heavy rock cuts were let to Lentz & Bowman. In the same month the very heavy slate rock cutting was commenced by Mr. Packer, but under the immediate supervision and direction of Mr. Robt. Lockhart. Some of these cuts were over 100 feet in height and required a vast amount of labor to remove them. These heavy sections were let in advance of the balance of the work in order to complete the whole simultaneously. About the first of May, 1853, the residue of the line was sublet, and soon after the contractors generally commenced operations.

"After proceeding with the work upon section No. 46 until the latter part of February, I was directed to change the original plan so as to form a connection with the Belvidere Delaware Railroad, as well as with the Central Railroad of New Jersey. This involved a very material increase of labor and expense, and delayed the completion of the work several months. Entire new plans had to be arranged and drawn, these required time to perfect, as the connection was a difficult one to make, on account of the difference in elevation and direction of the two roads. After the completion of the plans for the bridge across the Delaware, the work was sublet to Messrs. Comins & Murphy, who erected the span across the Delaware Canal, after which their contract was declared abandoned and the work relet to John W. Murphy. Much difficulty was experienced in the erection of the bridge across the river on account of frequent and continued high water. To obviate this difficulty it was suggested to try the experiment of raising the structure upon wire cables stretched from pier to pier. Mr. Murphy adopted the plan which proved eminently successful and enabled him to complete the work in a very satisfactory manner. The road was opened for the transportation of passengers from South Easton to Allentown on the eleventh of June, 1855, and two trains run daily to the latter place until the 12th of September, when the road was opened to travel to Mauch Chunk, one train a day being run until the 1st of October. Up to this time the road was operated by Mr. Packer (the contractor), with rolling stock hired from the Central Railroad of New Jersey.

"At a meeting of the Board of Managers held on the 19th of September it was resolved to accept the road for running from and after Monday the 24th inst. with the assent of the contractor. At the same meeting I was instructed to make arrangements with the Central Railroad Company of New Jersey for the running of the passenger trains upon your road, the time between the 19th and 24th being too short to perfect the running arrangements. I did not commence operating the road for the Company until the 1st of October, previous to which I contracted with the Central Railroad of New Jersey to run two passenger trains daily from Easton to Mauch Chunk, connecting with the Philadelphia trains of the Belvidere Delaware Railroad, thus affording ample facilities to the travelling public. On the 19th of November, one of the Central Railroad trains was withdrawn and a freight train with passenger car attached was substituted. This arrangement not proving at all satisfactory to the public, and having in the meantime purchased a passenger locomotive and cars, on the 24th of December the passenger train connecting with the early and late trains to and from New York and Philadelphia was run with our own cars; the Central Company still running the mid-day train. At the same time a daily freight train was put upon the road leaving Easton in the morning and returning in the evening. The receipts from passengers has been very satisfactory—in fact larger than was anticipated. The receipts from coal and miscellaneous freight has been limited by want of cars. The coal, iron, and iron ore transported over the road has been in cars furnished by the Central Railroad Company, Beaver Meadow Railroad & Coal Company and Packer, Carter & Co.

"In the early part of October an arrangement was entered into with Howard & Co. of Philadelphia to do the freighting business of the road (except coal, iron and iron ore) they furnishing cars, hands, etc. and paying at the rate of 3 cents per ton per mile for toll and transportation. An arrangement was also effected with A. D. Hope of New York for carrying his express matter at the rate of \$150 per month.

"The length of your road from Mauch Chunk to its eastern terminus is 45 38/53 miles. This, together with the Belvidere Delaware connection and the various sidings, make about 48½ miles of single track. The main track is laid with a rail weighing 56 pounds per yard, supported upon cross ties 6x7 inches and 7½ feet long, placed 2½ feet apart, and one-fourth of it is ballasted with stone or gravel. The road has a descending or level grade from Mauch Chunk to Easton, and with the exception of the curve at Mauch Chunk, has no curve of less than 400 feet radius. \* \* \* When the contemplated connection with the Little Schuylkill is completed, thus forming the shortest route from Lake Erie to New York, it may become necessary in view of the increased rate of speed required to compete with other routes, to improve the heaviest curves. The masonry is all constructed for a double track road and is of the most permanent character. There is over a half mile of bridging upon the road, in length of spans varying from 30 to 183 feet. They are substantially built structures and are all arranged for two tracks. With this amount of wooden bridges upon the road you will perceive at a glance the constant risk you run of having the business interrupted by the destruction of one of them. The mere loss of the bridge itself would be nothing compared to the partial or total suspension of a large business. \* \* \* I have no doubt but that iron intelligently used is the best and cheapest building material we have where permanency is required; and since the success of that great work of art (the spanning of Niagara River with a wire suspension bridge), by Mr. Roebling, has been fully established, you need never be at a loss for the want of an imperishable material for your bridges. Temporary passenger depots have been erected at Easton, Allentown, and Mauch Chunk. At Bethlehem you occupy the house belonging to Mr. Packer, which makes a very good passenger house, and will probably answer your purpose for some time to come. You are using for passengers, portions of the buildings erected by Howard & Co. for freight houses at Freemansburg, Catasauqua, Whitehall, Slatington and Lehigh. A permanent freight and passenger house is now in the course of construction at Easton by the Central Railroad Company to be used jointly by the two roads. Platforms have been built at all the stations upon the road. A frame engine house for the accommodation of two engines has been erected at Mauch Chunk, and a temporary one to accommodate one engine has been built at Whitehall. A turntable has been put in at Mauch Chunk; water stations have been erected at Lehigh Gap, Whitehall, Allentown and Chain Dam, affording an ample supply of water, except between Allentown and Chain Dam, and at Easton. These points, especially the former, must be supplied previous to the opening of the spring business. Bethlehem would seem to be the proper point and I would recommend the erection there at once of a steam engine of sufficient capacity to pump water and saw wood. The President of the Thomas Iron Company has agreed to supply you with all the water you may want at Hokendaqua free of expense, provided you will make that place a passenger station. This I have assented to and ordered the water tank put up. We are now using the engine house and turntable of the Central Railroad Company at Phillipsburg, which they have kindly tendered to us, and probably an arrangement might be effected with them for its use for some time to come, but in the event of any accident occurring to the trestling or bridge between South Easton and Phillipsburg it would subject us to inconvenience and loss of time in running the engines backwards. I would, therefore, recommend the erection of engine house, car house and turntable at South Easton. There also should be an engine house and car house at Mauch Chunk. Arrangements should be made as early as possible for the building of repair shops. The efficiency of our engines will be greatly impaired and the cost of transportation materially increased unless our rolling stock is kept in good order. Wood sheds should also be erected and two years' supply of wood purchased so as always to have one year's supply of seasoned fuel on hand.

"Sidings have been put in at Mauch Chunk, Lehigh Gap, Slatington, Whitehall, Allentown, Bethlehem and South Easton. There should be several miles additional laid in the spring. There should also be a weigh scale put in at Mauch Chunk

and some provision must be made for ground and sidings sufficient to make up these trains. Most of the coal operators in this region are expecting to increase their business, and several new works will go into operation during the spring and summer.

"The connection of our road with that of the Belvidere Delaware Railroad provides a down grade or level road from the mines to tide water, over which coal can be transported as cheaply as by any other improvement now in use. The difficulty of the difference in gauge has been obviated by constructing cars with wheels of broad tread that run equally well on both roads. The connection of the Central of New Jersey Railroad provides a communication to Newark, Jersey City, etc. which is as short as that from any other coal region and with far more favorable grades, there being no opposing grade greater than 21 feet per mile.

"The North Pennsylvania Railroad will probably be completed during the summer. This will open a new market to be supplied with coal and will also no doubt bring you a large amount of passenger and freight business.

"The Morris Canal Company are constructing a branch from the eastern end of the Delaware bridge to their canal and are erecting conveniences for loading coal into their boats at that point, thereby saving them the risk and expense of ferrying their boats across the river and doubling their boating facilities without any increase of capital.

"The Thomas Iron Company have constructed a branch from your yard running into the bridge house of their furnaces, by means of which they unload their coal and iron ore where no handling is required, except to hoist it into their furnaces. This convenience of course gives our road the preference over any other improvement for supplying their works.

"The Crane Iron Company have raised the bridge across the river to a level with our road and contemplate making a connection in the spring, with a view of getting a portion of the coal for the supply of their works by railroad.

"The Lehigh Valley Iron Works, Allentown Iron Works and Lehigh Zinc Works situated in such close proximity to your road, and with excellent opportunities for unloading their coal and ore, must eventually get all their supplies by railroad.

"With all these avenues open there can be no doubt but that upon the completion of the second track of the Beaver Meadow Road your road will be filled with business. In view of this, active measures should be taken at once to supply a sufficient amount of rolling stock to meet its requirements.

"A survey has been completed of the route through Mahoning Valley to connect the Lehigh Valley and Little Schuylkill Railroads. The examinations develop a perfectly feasible route with small amount of curvature and no ascending grade coming east necessary. Total distance from the mouth of Mahoning Creek to Tamaqua 17 miles 250 feet. Length of tangents 14 miles 4839 feet. Length of curved line 2 miles 691 feet. Total amount of curvature 412 degrees. Number of curves 13. Average degree of curvature 3 degrees 15' or 1,763 feet radius. The maximum grade is 50 feet per mile and is in favor of the coal trade. A heavy cut is encountered at the summit (4 miles from Tamaqua) by coming out of the Schuylkill Valley with a level grade, but in view of the immense coal tonnage that must eventually pass over the road from the Schuylkill and Shamokin regions I would without hesitation recommend the level being preserved even at an increased cost. \* \* \* Upon its completion and the completion of the Sunbury & Erie there will be a continuous line of railroad of uniform gauge from Lake Erie to Elizabethport, of less distance and far superior grades to any other route in operation or contemplation. The distance from Lake Erie to Philadelphia will be but 3 miles further via Lehigh Valley and North Pennsylvania than by the Little Schuylkill and Reading Railroads. This, I think, will secure to you at least one-half the travel to Philadelphia.

"The Little Schuylkill Company have in contemplation the construction of a railroad commencing about  $5\frac{1}{2}$  miles north of Tamaqua and running west about 6 miles into the Valley of the Mahanoy, from this point (10 miles east of Ashland) it may be necessary to make two roads, one opening the Mahanoy and the other the Shenandoah and Shamokin regions. \* \* \* New York is only 153 miles from the western terminus of the Mahanoy basin and 160 miles from the western terminus of the Shenandoah (in which is situated the celebrated Ashland mines), while a

considerable portion of the Shamokin basin can be reached without exceeding that distance. The distance from the coal deposits is less to New York via Lehigh Valley and Little Schuylkill Railroads, and the grades and other natural obstacles less than by any other route. Tamaqua is some 7 miles nearer New York than the first mine reached by the Beaver Meadow Railroad, this will give them the advantage of about 20 cents per ton in market over the Beaver Meadow region upon coal of the same quality and will, I think, induce a large shipment from that region."

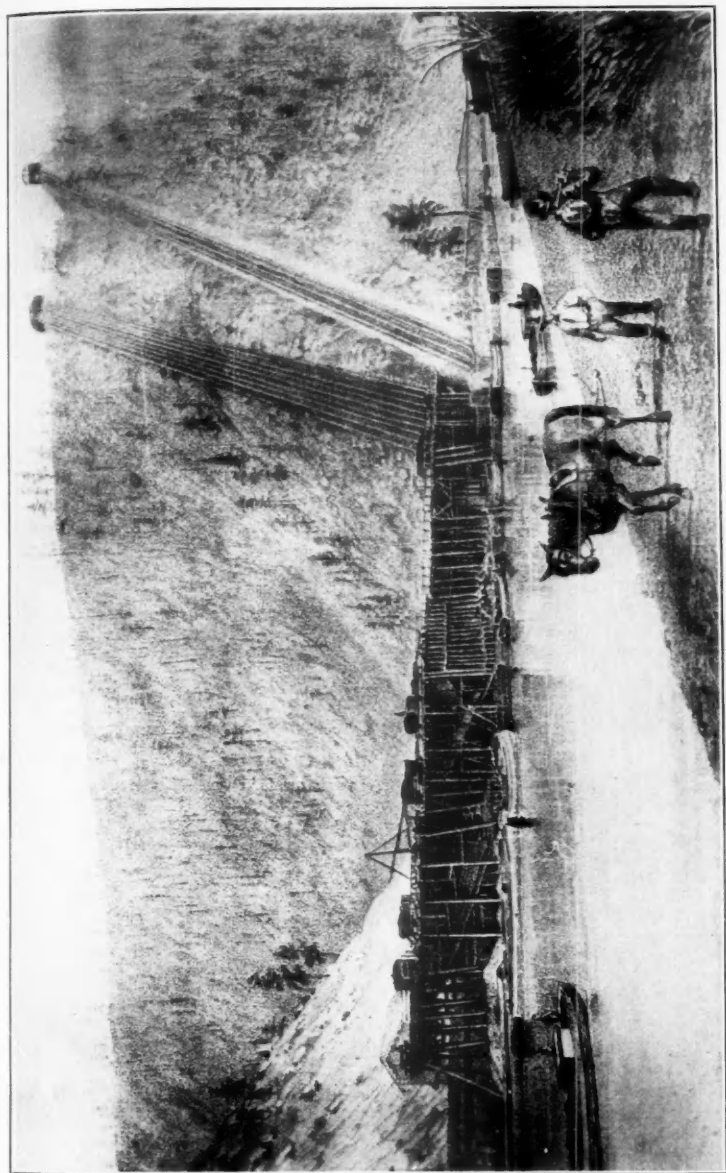
The winter of 1855 demonstrated that the six locomotives and small amount of equipment was totally inadequate to handle the traffic offered the road. Locomotives and cars were hired from the Central R. R. of New Jersey and a large sum was spent for the hire of this equipment. At Easton, one of the truss bridges gave way, due to the fact that the workmen had probably screwed some of the rods tighter than others causing an undue strain upon a few members. As the result of this disaster, all bridges on the line were strengthened with additional rods and William Kellogg was employed, whose duty it was to inspect and keep all bridges in repair.

On January 1, 1857, connections were made at Freemansburg with the North Pennsylvania R. R. A subsequent change in the tracks made the connection at Bethlehem, on August 3rd and this gave the Lehigh Valley R. R. an outlet to Philadelphia. That the Lehigh Valley was essentially a coal carrying road is clearly shown in this report as 75% of its receipts were derived from the transportation of coal. The cost of transportation is given as 39.7 cents per ton. Public distrust in the railroads had caused high interest rates on loans. The road had a first and only mortgage of \$1,500,000.00 and the road made a determined effort to reduce expenses in order that the floating debt might be reduced and eventually wiped out. Robert H. Sayre, formerly the Chief Engineer has now been made Superintendent of the road.

In 1859 the East Pennsylvania R. R. was completed to connect with the Lehigh Valley R. R. at Allentown and this opened a short line from New York and Harrisburg to the west. Mr. Robert H. Sayre has already started to make improvements of a substantial nature—wooden bridges and trestles will be replaced with those of steel; second track and sidings are being added and improvements made in the buildings; at Mauch Chunk a shop was purchased and a blacksmith shop built for the repairs to coal cars.

#### 1860-1869

In this decade the Lehigh Valley R. R. expanded from a 46 mile line from Easton to Mauch Chunk to a 199 mile line operating between Easton, Wilkes-Barre and Mount Carmel. Under the direction of William W. Longstreth, who was elected President of the road July 25th, 1864, this policy of expansion to acquire roads needed for their own protection was carefully followed. In 1864 the Beaver Meadow R. R., connecting with the Lehigh Valley R. R. at East Mauch Chunk, and extending to Penn Haven and to the rich coal mines in Carbon County, was acquired. The Penn Haven & White Haven R. R., connecting with the Beaver Meadow R. R. just below Penn Haven and extending to White Haven was also acquired. Although the total mileage was about forty miles, these roads with their connections tapped the rich Mahanoy,

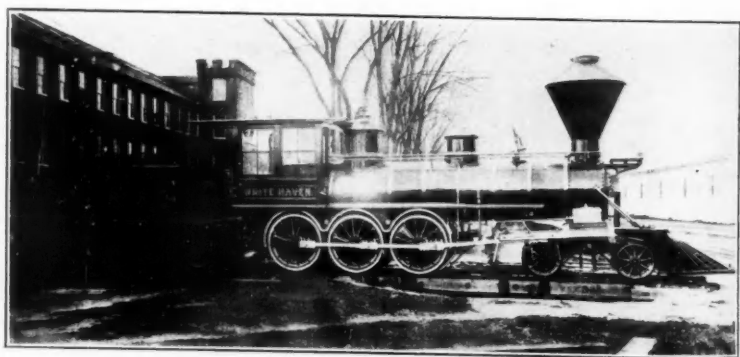


Courtesy of Clinton T. Andrews.

Planes of the Hazleton R. R. The one on the left built 1852, the one on the right built 1859. Abandoned 1862. "Penn Haven, Pa.," now called Penn Haven Jct., Pa. This road was part of the L. V. R. R.



Courtesy of Clinton T. Andrews.  
L. V. "Gazelle," McKay & Aidus, 1866 at Coxton, Pa.



L. V. "White Haven." Wm. Mason, 1863.

Beaver Meadow, Hazleton, Black Creek and Wyoming coal fields. On June 12, 1866, the Lehigh & Mahanoy R. R., extending from Black Creek to Mount Carmel, a distance of 40 miles and connecting with the Lehigh Valley R. R. above Mauch Chunk was consolidated with the road. The consolidation was affected by an exchange of stock, share for share, thus adding \$2,145,850.00 to the capital of the Lehigh Valley R. R. With remarkable foresight for the future, Judge Packer purchased a controlling interest in the North Branch Canal, extending from Wilkes-Barre to the New York State Line, a distance of over 100 miles. The title of the charter was changed and permission was granted to build a railroad—the Pennsylvania & New York Canal and Railroad Company. Judge Packer offered to transfer his purchase to the Lehigh Valley R. R. and, the offer having been accepted by the Board, it was proposed to build this road which would give the Lehigh Valley an outlet of its coal traffic to the north. On September 20, 1869, the Pennsylvania & New York Canal and Railroad Co. was opened for traffic from Northampton St., Wilkes-Barre to Waverly, N. Y., a distance of 105 miles. At Waverly a connection was made with the Erie Railway for Buffalo, N. Y., but the Lehigh Valley R. R. directors protected their interests in Buffalo by the purchase of a controlling interest in the Buffalo Creek R. R., a line 3½ miles long which would connect with all of the roads entering Buffalo save the Niagara Falls R. R.

So much for the expansion of the road during this decade. In the meantime Mr. Robert Sayre had not been idle in improving the property. On the night of June 4th and on the morning of the 5th, 1862, occurred the most destructive freshet known in the Lehigh Valley. The road was literally torn to pieces and coal shipments were suspended until July 8th. The track and masonry of the bridges across the canal and river at Mauch Chunk and the superstructure of the Mahoning Creek bridge were swept away. One of the bridge piers under the Delaware River Bridge was severely injured. Over five miles of the main line track was moved from its bed, 4.3 miles of second track embankment was washed away and about 1½ miles of track were lost entirely. The repairs made were of a permanent nature but it took until the following year to repair all of the damage done.

The steady increase in coal traffic made this little road, hemmed in by mountains and rivers feel the need of additional room. The Central R. R. of New Jersey notified the Lehigh Valley that they must deliver the loaded cars at Phillipsburg and furnish the track room for empty cars at South Easton, coming from the Central R. R. of New Jersey. At this time the Lehigh Valley was receiving loaded coal cars from three connecting roads and two canals at Mauch Chunk and the facilities were not sufficient to properly sort them at South Easton. Accordingly, land was purchased at Mauch Chunk where a large yard was laid out and the sorting was done by gravity. To relieve the congestion, a second track was completed between Mauch Chunk and Easton in 1865.

As early as 1863, Mr. Robert Sayre had a corps of engineers in the field to locate a route into Wilkes-Barre. The route finally selected had grades of about 90 feet to the mile, against the traffic and altho' this grade was heavy, it was but little more than that of the Delaware, Lacka-



wanna & Western R. R. and the elevation is 300 feet less than via Scranton. On May 29, 1867, an excursion train was run over this extension from Bridgeport (below White Haven) to Northampton Street, Wilkes-Barre, a distance of thirty-one miles. Coal, freight and passenger trains commenced running on June 17th. The average cost per mile of this extension, for gradation and masonry, was \$36,700.00. The track was laid with 60 pound rail on broken stone ballast.

This decade, in spite of the Civil War was one of expansion and improvement in transportation facilities. New and heavier rails were laid, double track and longer sidings were built, repair shops at South Easton, together with a 600,000 gallon reservoir and a system of flooding these shops in case of fire, new passenger stations constructed at Mauch Chunk, Bethlehem and Easton, new shops for the repair of coal cars at Mauch Chunk, enlargement of the Delaware River Bridge, the introduction of steel rails, the use of the telegraph to connect all points on the road with headquarters and other improvements to bring this transportation company to a position that would enable it to bring coal to the eastern markets. Perhaps in no better way can the increase in coal traffic be illustrated than in the following statement showing the distribution and the fact that the road owned in 1864, 1,127 eight wheel cars and 2,845 four wheel coal cars.

The coal traffic was distributed as follows:

	1859	1869
To the Belvidere Delaware R. R. ....	131,152	328,905 tons
Central R. R. of New Jersey .....	182,222	530,664
North Pennsylvania R. R. ....	77,483	191,891
East Pennsylvania R. R. ....	3,579	10,219
Catasauqua & Fogelsville R. R. ....	4,384	5,348
Morris Canal .....	4,688	127,436
At L & B Jct. to Pa. & N. Y. R. R. ....		7,398
Mt. Carmel for Northern Central Ry. ....		2,517
Penn Haven Jct. to L & S R R for canal .....		121,315
Penn Haven Jct. to L & S R R for rail .....		4,562
Mauch Chunk for canal .....		101,003
Above Mauch Chunk for Co. use .....		44,051
On line of road above Mauch Chunk .....		8,623
At Mauch Chunk .....		965
Packerton to L & S for rail .....		4,440
On line of road below Mauch Chunk .....		574,750
On line of road for use of R. R. Co. ....		35,736
For Morris & Essex R. R. ....		210,352
Total .....	577,651	2,310,170 tons

In 1868 there were important changes in the officers of the Lehigh Valley R. R. Early that year, Mr. William W. Longstreth, whose policies of expansion have been outlined, resigned as President as his health had become seriously impaired. He tendered his resignation but his services were retained as a member of the Board of Directors. He was succeeded by Mr. Asa Packer, a man who had been identified with the road from the outset and whose interests had always been identified with this enterprise. Mr. Charles Hartshorne was elected Vice President. The office of Secretary and Treasurer was separated and Mr. L. Chamberlain who had filled them both was elected Secretary and Mr. C. C. Longstreth was elected Treasurer.



## 1870-1879

In spite of the financial depression which marked this decade, we find the road expanding and improving its facilities. The need of an independent outlet to tidewater has been apparent for a number of years. In 1871 the Board of Directors of the Lehigh Valley R. R. concluded a perpetual lease of the property of the Morris Canal & Banking Co., by means of which they came into the possession of a canal 102 miles in length extending from their road at Phillipsburg to Jersey City, with a basin of sixty acres, having a frontage of 1500 feet on the North River directly opposite New York City. The road assumed payment of interest on the Canal's indebtedness; of dividends averaging 7% on the preferred and consolidated stocks and payment of \$25,000. annually to the State of New Jersey as well as sums for maintaining the property. The road also acquired an interest in the New Jersey West Line R. R., a road being opened, 1871, from Summitt station on the Morris & Essex R. R. to Bernardsville, a distance of 14 miles.

In 1871 a charter was obtained from the New Jersey Legislature for the Bound Brook & Easton R. R., authorizing the construction of a railroad between these two places. This company was in turn consolidated with the Perth Amboy & Bound Brook R. R. to form the Easton & Amboy R. R. Although contracts were let for the construction of the road, operations were delayed on account of the financial depression of 1873. Considerable difficulty was experienced in driving the tunnel through Musconetcong Mountain but this end of the work was pushed in spite of the depression. On May 28th, 1875, the work on the Easton & Amboy R. R. was completed and the first train—a coal train of 125 cars, hauled by one locomotive, with a helper to the tunnel, made the trip from Phillipsburg to Perth Amboy, a distance of 60 miles in 6½ hours. On June 22nd following, a special train carrying the officials of the road and their guests inspected the property and on the 28th of June the road was formally opened for traffic as the "New Jersey Division" of the Lehigh Valley R. R. Arrangements had been made with the Pennsylvania R. R. by which the passenger and miscellaneous freight trains would run directly to Jersey City. Mr. H. E. Packer was appointed Division Superintendent.

On the west end, we find that the Pennsylvania & New York Canal & Railroad Co. have been active. In 1876 an agreement was entered into with the Receiver of the Erie Ry., whereby the Lehigh Valley R. R. would advance the rails necessary to complete the 4 foot 8½ inch gauge to East Buffalo and thus enable the Lehigh Valley R. R. to run their cars through to Buffalo and the International and Suspension Bridges. The work was completed during the summer in time to be of great value in transporting passengers to Philadelphia.

By the terms of an act passed by the Legislature of Pennsylvania and approved by the Governor on April 2, 1872, the Pennsylvania & New York Canal & Railroad Co. was relieved from any and every obligation to maintain their canal for navigation purposes, provided that the portion between the Feeder Dam on the Lackawanna River and Northampton Street, Wilkes-Barre, shall be kept in repair so long as it may be necessary to feed the canal between Wilkes-Barre and Nanticoke Dam.

The abandonment of the canal afforded the road the opportunity of better alignment, removing a number of bridges and afford room for the much needed double track. It seems almost a coincidence that on October 9th, 1872 occurred the death of Col. Charles F. Welles, first President of the Pa. & N. Y. Canal & R. R. Co. When the canals of the State of Pennsylvania were sold, Col. Welles and his associates purchased that portion extending from Wilkes-Barre to the State Line. Finding his investment unprofitable, he received authority to construct a railroad upon the towing path. At that time he owned nearly the entire stock and it was Col. Welles who sold his interests to Asa Packer, agreeing to take in part payment stock of the new company. As we know, Asa Packer transferred the road to the Lehigh Valley R. R. but Col. Welles had his wish gratified in seeing the construction and operation of a railroad up the valley of the Susquehanna and extend to the Great Lakes.

Southern Central Jet., later known as Sayre became an increasingly important point. Here the Ithaca & Athens and Southern Central Railroads joined with the Pa. & N. Y. Canal & R. R. The Cayuga Lake R. R. connected the Ithaca & Athens R. R. with the New York Central at Cayuga and the Geneva & Ithaca R. R. formed a connection with the New York Central at Geneva. In 1875 these companies were reorganized, a new company formed—Geneva, Ithaca & Sayre R. R. Co., and control rested with the Lehigh Valley R. R. in order to protect their interests. This furnished an outlet for the coal movement and a protection against the movement over the Erie Ry.

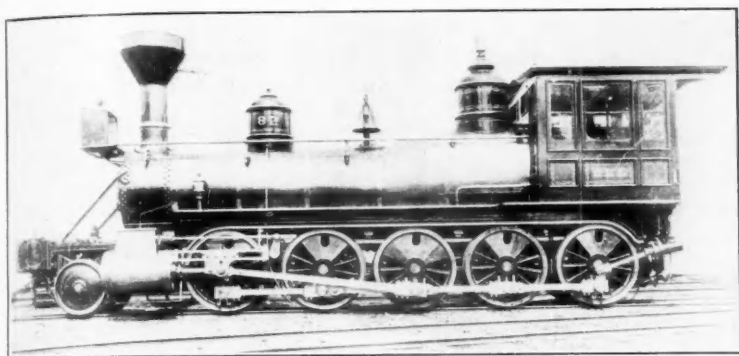
Perhaps in no better way can the growth of the Lehigh Valley R. R. be shown than to quote Mr. Robert Sayre in his report for 1880:

"In 1856, we had a single track extending from Phillipsburg to Mauch Chunk, forty-six miles, with a capital and debt of \$2,500,000; we owned ten locomotives and not a single coal or freight car; our coal tonnage was 165,740 tons; the gross receipts of road \$242,512.61; net receipts \$98,928.65 and our pay-roll amounted to \$41,233.30.

"Our present report shows:—Main Line from Perth Amboy to Wilkes-Barre, 161 miles; Main branches to Mount Carmel connecting with the Northern Central R. R. and to Tomhicken connecting with the Sunbury, Hazleton & Wilkes-Barre R. R., together, 66 miles; also various other branches aggregating 53 miles making a total of 280 miles of track, a great part of which is double track and laid with steel rails. Coal tonnage for the year 4,606,415 tons; gross receipts \$7,762,990.90; net receipts \$3,760,633.30; summary of pay rolls \$4,148,698.15; 255 locomotives, 24,465 coal cars and 3,139 freight, passenger and other cars. The capital and debt amount to \$52,907,195.00 included in which is the ownership or control of about thirty thousand acres of coal lands, with their collieries; the ownership of the Pennsylvania & New York Canal & Railroad, 105 miles in length with its equipment and a large interest in the Geneva, Ithaca & Sayre R. R., 114 miles long with its equipment.

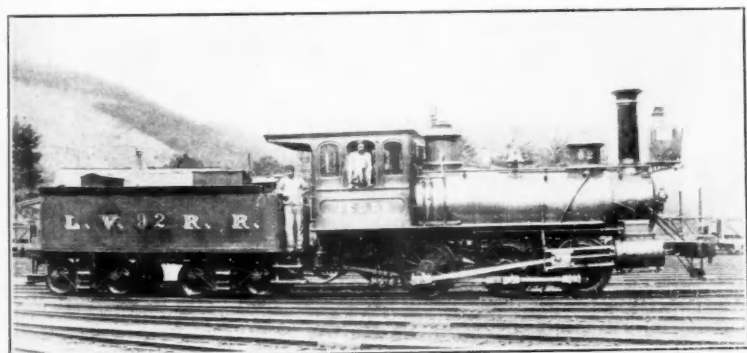
"During these twenty-five years, the Lehigh Valley R. R. proper has transported 60,027,387 tons of anthracite coal to market, the gross receipts from all branches of transportation have been \$96,947,130.55 and net receipts \$45,291,210.11. In this time there has been paid for labor \$42,188,640.11, which item however includes payment of the employees of the P. & N. Y. C. & R. R. Co., of the G. I. & S. R. R. Co. and the Lehigh Valley Coal Co.

"There has been paid in dividends during the time mentioned, in cash, 185.83 per cent., and in stock, 72.28 per cent., or an average of 9.92 per cent. per annum for the entire period."



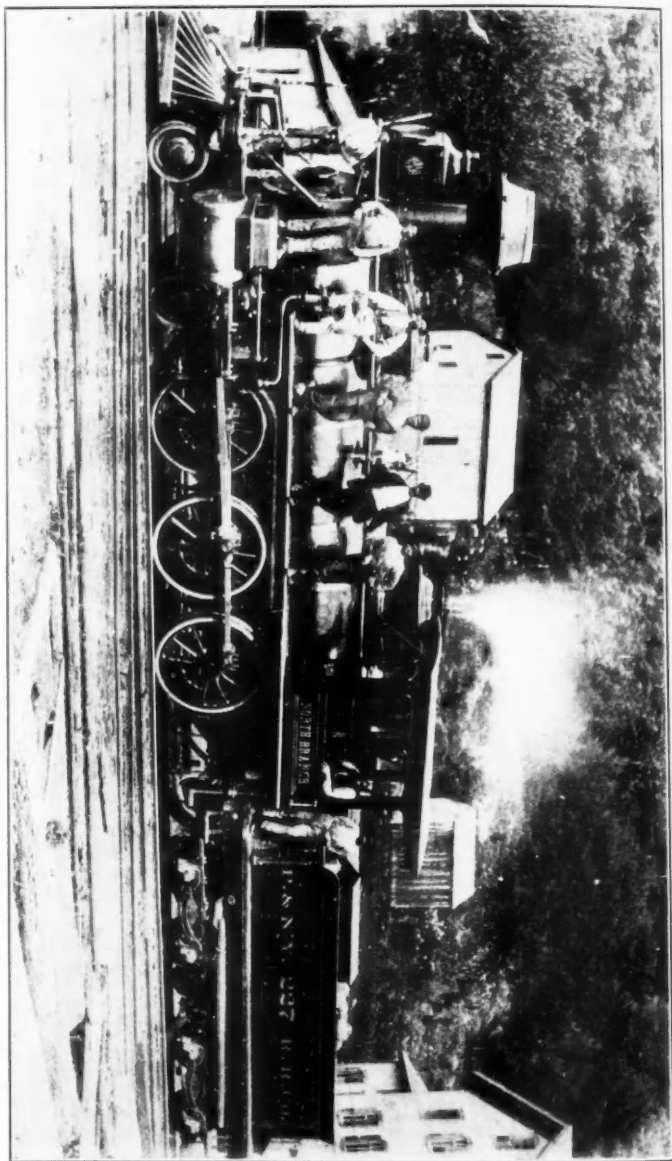
Courtesy of Clinton T. Andrews.

L. V. S2, "BEE", E. S. Norris, Lancaster, Pa., 1867.



Courtesy of W. A. Lucas.

L. V. 92, "Jeddo," Hazleton Shops, 1869.



Pa. & N. Y. R. R. 227 "North Branch," Baldwin, 1869. Built for the L. V. R. R.  
 Transferred to Pa. & N. Y. R. R. 1874. (Courtesy of Clinton T. Andrews.)

In 1870, the officers of the Lehigh Valley R. R. decided that it was wiser to consolidate offices of the several companies, which had to do with the keeping of the accounts and transfer them all to the executive offices at Philadelphia. The Pennsylvania R. R. was building their new building on Fourth Street and the Lehigh Valley purchased the premises owned and occupied by the Pennsylvania R. R. at 238 South Third Street. Delay on the part of the completion of the new building for the Pennsylvania R. R. prevented the Lehigh Valley R. R. from the use of their building until May, 1872.

The decade closes with the loss of two men, long associated with the affairs of this company. On May 17, 1879, the Honorable Asa Packer died! No better expression can be found than the words in the Annual Report for this year:

"The man of iron nerve, whose life was one of purity and uprightness, simple in habit, dignified in demeanor, fervent, earnest, free from all forms of ostentation, liberal beyond measure, to whose magnanimity of soul hundreds of living witnesses pay heartfelt tribute, had passed away on May 17, 1879."

At a meeting of the Board of Directors held on June 10th of that year, a series of resolutions were adopted, in which it was said:

"The Directors of the Lehigh Valley Railroad Company have heard with profound sorrow of the death of their President, the Honorable Asa Packer, by which each one of the Directors has lost a true and valued friend, the company has lost its founder and sagacious leader, the laboring man has lost a sympathetic benefactor and our country has lost a useful and patriotic citizen."

At this meeting the Board of Directors felt it was inexpedient to appoint a President at this time and Vice President Charles Hartshorne should act as President during the interim.

On June 3rd, 1879, William W. Longstreth died. Mr. Longstreth had established a reputation for honest and able management before he became connected with the Lehigh Valley R. R. On more than one occasion he had taken charge of a railroad whose affairs were in desperate shape and by his ability and energy had made it prosperous. He was a railroad restorer. He was President and director of the Beaver Meadow Company for nineteen years and a director of the Lehigh Valley R. R. for eleven more. He inspired the confidence of his associates and sustained the reputation he had acquired.

Thus, within a month, the Lehigh Valley R. R. lost by death, two of its ablest men.

#### 1880-1889

This decade is marked with considerable expansion in the western territory of the road. In order to reduce the expenses of operation it was deemed best to lease the property of the Pennsylvania & New York Canal & Railroad Company, altho the Lehigh Valley R. R. had held a majority of the stock from the outset. Accordingly, on December 1st, 1888 a lease of this property was executed for ninety-nine years. All locomotives and equipment were sold to the Lehigh Valley R. R. This included 109 locomotives, 1 passenger car and 232 items of freight equipment.

The road continues to use the third rail of the New York, Lake Erie & Western Ry., the Lehigh Valley continuing to furnish the locomotives and cars to handle this coal into Buffalo. The apparent need of steam-

ship connections at Buffalo for lake ports has grown in the passing years. In 1888 a new steel steamer of about 2500 tons was placed in service on the Great Lakes and two additional steamers were contracted for. The Vosburg Tunnel was completed and opened for traffic on July 25th, 1886. On March 24th of the same year, a traffic agreement was made with the Wabash R. R. for the handling of fast freight over these two roads via Buffalo and Suspension Bridge.

At various times the Lehigh Valley R. R. had invested sums of money in the Southern Central R. R. of New York in order to enable that company to make improvements and conduct its business. It was felt that this road, commencing at Freeville, N. Y., where a L. V. connection brought it to Sayre and extending to Fairhaven, N. Y. on Lake Ontario, might better be operated as a part of the Lehigh Valley R. R. In 1886 the property was taken over and it became known as the Southern Central Division.

The Geneva, Ithaca & Sayre R. R. was purchased through foreclosure by the Lehigh Valley R. R. in 1889. The road was reorganized as the Geneva & Sayre R. R. In a like manner, the Ithaca, Auburn & Western R. R. was sold under foreclosure. The portion of the road between Genoa and Freeville was abandoned and the portion north of Genoa operated as a part of the Geneva & Sayre Division of the Lehigh Valley R. R.

On the eastern end of the road, the "Mountain Cut-Off", extending from Fairview to Pleasant Valley, a distance of 16 miles, was completed and opened for coal and freight service on November 21, 1888. This line effected a reduction in grades from 96 to 64 feet to the mile and a saving of six miles in distance for traffic from points north of L & B Jet, and mines west of the Susquehanna River to all points south and east of Wilkes-Barre Mountain and completed the double track between Fairview and Pittston.

In 1887 a line was constructed in connection with the Pennsylvania R. R., between Shenandoah and Frackville by which Shenandoah and points west thereof are brought in closer connection with Pottsville and the Schuylkill Valley. Thus with the New Boston to Hazleton branch, Lehigh Valley trains were running directly into Pottsville.

In 1880, the new shops and roundhouse at South Easton were completed at a cost of \$128,000.00. In 1881, the new machine shop at Sayre was occupied and additional buildings were soon completed. Two engines were completed in these shops in 1887, this notation being found in the report for that year. The policy of improving the road and its structures for the successful operation of its coal business steadily continues.

In 1883, Robert Asa Packer, elder son of the late Hon. Asa Packer, died at Jacksonville, Florida, on Feb. 20th. Mr. Packer was not only a director of the Lehigh Valley R. R., but President of the Pennsylvania & New York Canal & R. R. Co., President of the Geneva, Ithaca & Sayre R. R. and it was through his influence that the facilities at Buffalo were constructed and the steamships on the Great Lakes were built. On January 1, 1885 occurred the death of the Hon. Harry E. Packer, President of the Lehigh Valley R. R. This was the last member of the Packer family to be associated with the road. The sad family record is as follows:

the father in May, 1879; the mother in November, 1882; the only brother in February, 1883.

On June 23, 1882, Mr. David Thomas of Catasauqua, the oldest member of the Board of Directors died. Mr. Thomas was a pioneer in the anthracite trade and was very closely associated with the late Hon. Asa Packer. On September 25th, of the same year, Mr. Ashbel Welch of Lambertville, N. J. died. Mr. Welch was the last of the older men on the Board of Directors.

In 1885, the office of Second Vice President was created and Mr. Robert H. Sayre who had been identified in both the construction and the operation of the road since its beginning, was appointed by the Board to fill the position. Save for an interval of a few years, Mr. Sayre had been continuously connected with the Lehigh Valley R. R. from the very outset.

Events for the first few years of the next decade were so important that I have taken the liberty of treating each year separately.

### 1890

The two steel steamers contracted for last year have been completed and are now in operation by the Lehigh Valley Transportation Company, the latter company controlled by the Lehigh Valley R. R. This company has a fleet of five steel steamers and six wooden ones. The Geneva & Sayre R. R., the Geneva & Van Ettenville Ry., the Buffalo & Geneva Ry., and the Auburn & Ithaca Ry. have all been consolidated under the title of The Lehigh Valley Rail Way Company and that company has the contract to build the line between Buffalo and Geneva and from Geneva to Van Ettenville. An agreement has been entered into between the Lehigh Valley Rail Way Co. and the Rome, Watertown & Ogdensburg R. R. for the use of the Rail Way Company's terminals in Buffalo by the latter company and by the Buffalo, Thousand Islands and Portland R. R., now under construction. The \$600,000 of Ithaca & Athens R. R. Co. seven per cent. bonds which were due July 1st last have been paid and the mortgage cancelled. This leaves the \$15,000,000 Lehigh Valley Rail Way Company mortgage, recently executed, as the only mortgage obligation existing against the New York railroad corporation.

The Eastern & Northern R. R., promoted by the Lehigh Valley R. R., has completed its line from Easton up the valley of Bushkill Creek, 8 miles to a junction of the Bangor & Portland R. R. at Belfast. It was opened for traffic on Sept. 29, 1890 and is operated by the latter company. Work is progressing on the Roselle Branch and it is hoped to make the connection with the Pennsylvania R. R. early next year. This will reduce the distance between New York and South Plainfield by four or five miles. Steady progress has been made with the extension across Newark Bay to a connection with the National Docks R. R., in which the Lehigh Valley has purchased an interest, and which is now in operation between the Pennsylvania R. R. at Point of Rocks and Communipaw Ave. in Jersey City.

The Jordan Loop and new passenger station at Allentown was placed in service on May 12th, 1890, and a branch from Jordan Loop westwardly to the fairground at Seventeenth and Liberty Streets, Allen-



town, was placed in service Sep. 29th, 1890. This is being extended to a junction with the Barber's Branch and when completed will form a belt line around the city of Allentown. A new and commodious passenger station has been built and placed in service at Easton, Pennsylvania during the year.

The Schuylkill & Lehigh Valley R. R., operated by the Lehigh Valley R. R. as the Pottsville Division was opened for service between Schuylkill Haven and Pottsville on August 18th, 1890. On September 15th, 1890, just thirty-five years after the hauling of the first coal train over the main line of the Lehigh Valley between Mauch Chunk and Phillipsburg, the line was opened from Schuylkill Haven to Blackwood and the first coal train was brought out. This line gives the Lehigh Valley access to the important Schuylkill Valley and opens up a large area of coal lands tributary to their interests. The Pennsylvania, Poughkeepsie & Boston R. R., connecting with the Lehigh Valley R. R. at Slatington was opened for business about January 1st, 1890. This road affords a connection with Boston and interior points in New England.

On Sept. 12th, 1890, Mr. William Broekie, a Director of this Company, died of apoplexy. Though only a member of the Board for three years his counsel was especially valued in financial and maritime questions. Mr. George C. Thomas, of Philadelphia, was elected to fill the vacancy. Again, on Sept. 18th, 1890, Mr. A. G. Broadhead, of Mauch Chunk, Superintendent of the Beaver Meadow Division, died. Mr. Broadhead occupied that position since the consolidation with the Beaver Meadow Railroad and Coal Company in 1864, with which company he had previously been identified for many years.

#### 1891

For the last few years there has been a decline in the average rate per ton on anthracite coal, from 96 cents in 1888 to 90 cents in 1889, 85.3 cents in 1890 and to 81.89 for 1891. The rate per ton per mile has also shown a corresponding decrease from .981 cents in 1888 to .849 cents in 1889, .841 cents in 1890 and .832 cents in 1891. These reductions are mainly due to shorter hauls and to the increased tonnage of the smaller sizes of steam coals which are carried at reduced rates. This loss in revenue has caused the management to look to farther fields in the way of increasing the business of the road as well as to increase the coal tonnage.

The new line to Buffalo is expected to be ready for service next May, the date upon which the contract expires with the New York, Lake Erie & Western R. R. For the year 1891, the Lehigh Valley R. R., paid the New York, Lake Erie & Western R. R. for trackage alone more than one and one-quarter million dollars for traffic moved by their own power in their own trains with no expense to the New York, Lake Erie & Western R. R. save for the maintenance of the tracks. Increase in traffic on the New York, Lake Erie & Western R. R. has caused great delay in traffic to the Lehigh Valley trains. Small wonder that the Lehigh Valley wished to be rid of this traffic arrangement and expense.

The coal storage plant at South Plainfield has been in operation several months and promises to do much in the reduction of expense in the cost of handling coal. There are seven groups of storing floors,



two floors in a group, with an aggregate capacity of 310,000 tons. The first coal was dumped on July 14th, 1891.

Arrangements have been made with the New York Central & Hudson River R. R., which, during the past year acquired the Rome, Watertown & Ogdensburg R. R., to provide for our business to and from the bridges across the Niagara River, Buffalo, Batavia and intermediate points.

The Rochester & Honeoye Valley R. R. Co. together with about twenty acres of land in the city of Rochester came under the control of the Lehigh Valley R. R. during the year. Rapid progress is being made in the completion of the road from Rochester to a junction with the main line, about fourteen miles, and early next year it is expected to have train service into Rochester, N. Y.

The Roselle & South Plainfield Ry., the Newark & Roselle Ry., the Newark Ry., the Jersey City, Newark & Western Ry., the Newark & Passaic Ry., the Edgewater Ry., and the Jersey City Terminal Ry. Companies, being the roads which form the through line between the Easton & Amboy R. R. at South Plainfield and the harbor of New York City were consolidated into one corporation—the Lehigh Valley Terminal Railway Company.

On Feb. 16th, 1891 trains for New York were discontinued via Metuchen and from that date they were run over their own line from South Plainfield via Roselle to West Newark Jet., and thence via the Pennsylvania R. R. to Jersey City.

Increases in the weight of equipment has made it advisable for the strengthening of all bridges upon the main line as well as the replacement of the lighter rails with the present standard 80 pound rail.

## 1892

The Lehigh Valley Rail Way Company's new line between Van Etten and Geneva and thence to Buffalo has been completed during the year. On account of the very heavy grades on the old line between Van Etten and Geneva, and the great volume of business done via the Erie Ry., it was deemed best not to transfer this business until at least one track of the new line between Van Etten and Geneva was in complete order. This was accomplished and the transfer made in September of this year. A second track was also completed.

Work on the Lehigh Valley Terminal Railway has continued during the year. The bridge across Newark Bay is completed; also the extension through Jersey City to the waters of New York Bay and to a connection with the National Docks Ry.

The Loyalsock R. R., connecting the Harvey's Lake R. R. with the State Line & Sullivan R. R. has been completed. The Williamsport & North Branch R. R. are extending their road from Nordmont to a connection with the State Line & Sullivan R. R., thus forming a connection with Williamsport, Pa., and all points on our road. The rapidly increasing business demands the double-tracking of the Mountain Cut-Off between Fairview and Pittston. The estimated cost is \$225,000.00.

Mr. Ario Pardee, a Director of this road since May 13th, 1868, died in Florida on March 26th of this year. Mr. Pardee was one of the

pioneers of anthracite coal mining and possessed a fund of knowledge of the country tributary to the lines of the road. Mr. Rollin H. Wilbur was elected a Director to fill the vacancy.

On the morning of Christmas Day, Mr. H. Stanley Goodwin, General Eastern Superintendent, died. He had been connected with the road for twenty-six years.

Now the most interesting item in the report for this year, aside from the completion of the road to Buffalo, is the fact that on February 11th, 1892, the railroads, public works, transportation lines and appurtenances (not including the Lehigh Valley Coal Company) were leased and transferred to the Philadelphia & Reading R. R. Co. for the full period of nine hundred and ninety-nine years, from the first day of December, 1891. The lease guarantees rentals equal to five per cent. per annum for the six months ending May 31, 1892, six per cent. for the six months ending November 30, 1892 and seven per cent. thereafter, together with fifty per cent. of all surplus net earnings, but not in any one year exceeding in all an amount equal to ten per cent. upon the then outstanding capital stock.

The lease of the Lehigh Valley R. R. by the Philadelphia & Reading R. R. was the result of the first anthracite coal combination and it created quite a sensation in the political circles of New Jersey and Pennsylvania. In January, 1888, the Philadelphia & Reading R. R. emerged from a receivership in which the interest and rental charges were reduced and the control of the New Jersey Central System was surrendered. In 1888 a number of small lines in Pennsylvania and New Jersey were acquired the chief being the Philadelphia & Atlantic City R. R.

In 1890 a consolidation was arranged between the Baltimore & Ohio, and the Western Maryland by which these two companies together with the Philadelphia & Reading would control a new route between Harrisburg, and Pittsburgh, thus extending the system far beyond its western limits. The Port Reading R. R. was built which gave the road an independent outlet to the Atlantic coast near New York City.

The coal business of the system was its key to success and this coal business had been steadily increasing. Other roads such as the Delaware, Lackawanna & Western; the Erie and the Lehigh Valley were doing a substantial and growing coal business and it seemed important for the Reading management that it should securely hold this coal business. Accordingly, in 1891, contracts were made with the Penn Anthracite Coal Co. and with Coxe Bros., both parties being extensive miners and shippers of coal, which required that all coal shipped by either concern should be sent over the Reading System. Following this, the Lehigh Valley R. R. was leased and on the day following, the New Jersey Central System was leased to the Port Reading R. R. for nine hundred and ninety-nine years. Contracts were then made with the Lehigh Valley Coal Co. and the Lehigh & Wilkes-Barre Coal Co. and with various other independent coal operators for the direct purchase of their entire product by the Philadelphia & Reading, the latter company agreeing to pay them for their coal (delivered in cars at the mines), certain percentages of the prices that might be received from time to time for coal delivered at tide-

water near New York. In this way practically the entire anthracite coal interests were pooled.

The Reading did not overlook the bituminous coal markets. On May 10, 1892, it entered into a contract with the Buffalo, Rochester & Pittsburgh Ry. and the New York Central system, under which a line called the Clearfield & Mahoning R. R. was to be built from DuBois, Pa., to a connection with the Beach Creek R. R. at Clearfield; the B. R. & P. Ry. agreeing to forward its entire coal traffic bound east and south over the Beach Creek and the Philadelphia & Reading and to turn over to the Philadelphia & Reading the management of all coal transportation.

Having succeeded in controlling the coal that was mined, it was only natural that Mr. McLeod of the Philadelphia & Reading find a market for his products and New England was the next field of operations. In 1892 he secured a controlling interest in the Poughkeepsie Bridge Co. and also in the Central New England & Western R. R., the latter extending from Campbell Hall, N. Y. to Hartford. On February 3rd, 1892 the Philadelphia & Reading R. R. began to operate trains to Hartford, Connecticut and other New England points. A few months later the two mentioned companies were consolidated as the Philadelphia, Reading & New England R. R. The Dutchess County R. R. was the next road that was leased. The next two roads were the Boston & Maine and the New York & New England, the latter being held by the Boston & Maine and the Philadelphia & Reading interests and on October 26, 1892, the president of the Philadelphia & Reading R. R. was elected president of the Boston & Maine R. R. and the coal markets were secured.

Unfortunately the Philadelphia & Reading did not have the financial strength to carry through such an ambitious plan. The Boston & Maine stock had been purchased largely on margin, depositing Reading bonds to protect its purchase. When the interest became due in February, 1893 on the preference income bonds, it became necessary for the company to maintain the market price of these incomes in order to prevent its loans from being called and it adopted the hazardous expedient of paying the full rate when it should not have done so and borrowed the money to make the payment. The money so used was secured by turning over practical control of the railways and coal business to the loaners, and issuing further collateral trust bonds to the extent of \$10,000,000. These various transactions exhausted the credit of the company and, being unable to secure further financial help, receivers were appointed on Feb. 20, 1893.

The receivership resulted in the abrogation of the coal contracts, the cancellation of the lease of the Lehigh Valley and the Central R. R. of New Jersey and the loss of the New England roads. In brief, the entire system, which had been so ambitiously built up, crumbled to pieces in a few months and the Philadelphia & Reading had again shrunk to the size and character of its first reorganization.

### 1893

The lease of the Lehigh Valley R. R. to the Philadelphia & Reading R. R. was officially terminated on August 8th of this year. The work of straightening out the tangle of difficulties still remains.

An arrangement was made with the Receiver of the Pennsylvania, Poughkeepsie & Boston R. R., by which that portion of the road between Slatington, Pa. and Hainsburg Jet. N. J. is to be operated by the Lehigh Valley R. R. This secures an outlet for coal shipments to the territory adjacent to the above line and to that of the Bangor & Portland Ry. and connections.

Arrangements have been entered into for the interchange of business with the New York, New Haven & Hartford R. R. by transfer of cars on floats between Jersey City and Harlem River.

The report includes a statement of the length of lines of the Lehigh Valley System as follows:

Easton & Amboy R. R. (including all lines east of Phillipsburg)	95.34 miles
Lehigh Division	54.61 miles
Wyoming Division	141.49 miles
Beaver Meadow Division	16.53 miles
Hazleton Division	26.11 miles
Mahanoy Division	80.40 miles
Pottsville Division	40.70 miles
North Branch Division	123.41 miles
Buffalo and Seneca Divisions	250.14 miles
Auburn Division	159.75 miles
Penna. Poughkeepsie & Boston R. R.	226.55 miles
Easton & Northern R. R.	8.04 miles
Total	1023.07 miles

The above does not include second track and sidings.

#### 1894

The condition of the anthracite coal trade, upon which this road is greatly dependent, has been particularly bad—worse during 1894 than in any previous year. The road carried 653,693 less tons, a decrease of nearly 4% over the year previous. The aggregate number of passengers was reduced about 1,500,000, or over 23% from the number carried in 1893. The World's Fair traffic accounted for some of this. On the other hand there has been an increase in the through passenger business between the Atlantic seaboard and Niagara Falls but there has been a loss in some passenger business due to the opening of electric railways between many of the towns between which we have formerly carried passengers at low fares. In connection with improving the service between New York and Chicago, a high-grade dining car service on the "European" plan has been introduced.

On January 31st of this year, the Delaware, Susquehanna & Schuylkill R. R. was granted the privilege of running its own coal trains laden to tidewater thus assuring this company for fifteen years of important coal traffic (that of the Cross Creek Coal Co., formerly Coxe Bros. & Co.) for which several outlets existed.

The line of the Southern Central R. R., extending from Sayre, Pa. to North Fair Haven, N. Y., on Lake Ontario, 117 miles in length, which has been operated since Dec. 29, 1886 under agreement with that company, passed into the hands of a Receiver in July, 1894. We have continued to operate the road as formerly. The Lehigh Valley R. R.



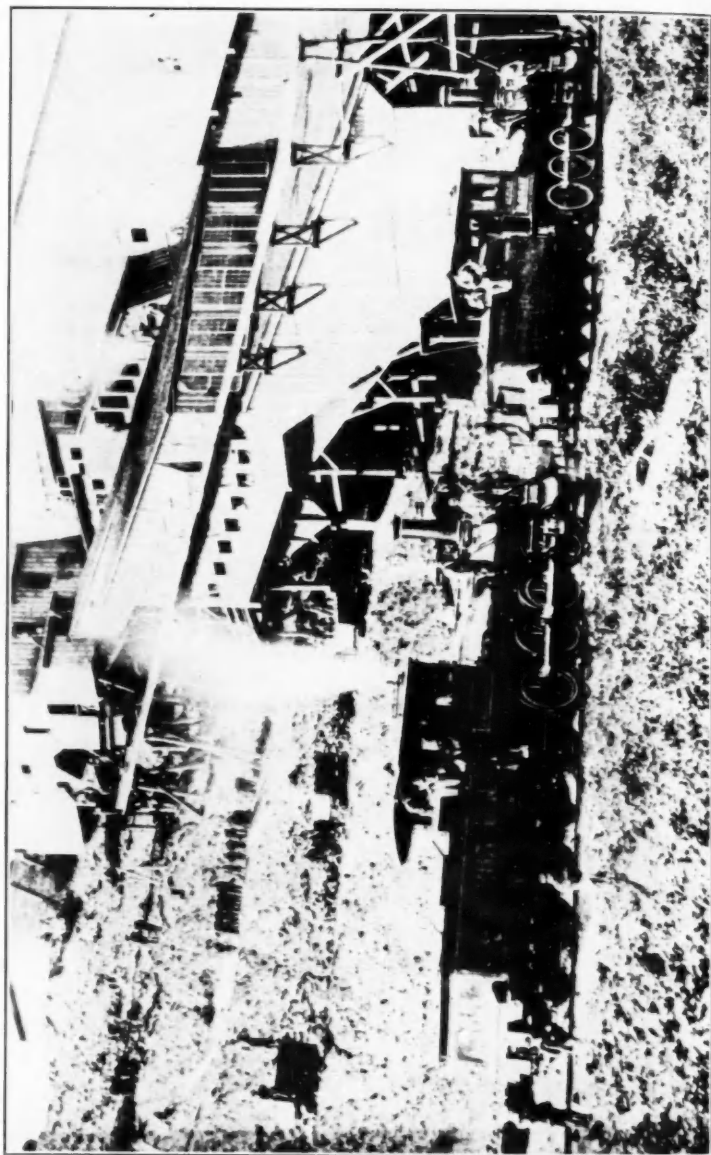
Courtesy of K. E. Schlachter.

L. V. 147, "L. Chamberlain." Delano Shops, 1870.



Courtesy of Clinton T. Andrews.

L. V. 368 "Rambler." Weatherly Shops, 1881.



A typical colliery scene. L. V. "Hazel Dell," Delauro Shops, 1882 and "Logan," Delano Shops, 1882.

Courtesy of Clinton T. Andrews.

holds all of the first mortgage bonds and about 60% of the consolidated mortgage bonds.

The arrangement effected with the New York, New Haven & Hartford R. R. for the transfer of cars without transfer of lading has resulted not only in the opening up of a new market for our mineral products but for a new route for products from the middle west.

During the past year arrangements were made with the United States Express Co., whereby that company would handle the express business on this road. The express business has increased to the extent of necessitating a fast night train, composed exclusively of express cars, to operate from Jersey City to Buffalo.

The double tracking of the mountain cut off has been completed. This was compelled by the frequent congestion of traffic between Pittston and the summit of Wilkes-Barre Mountain. The Rochester & Honeoye Valley Railroad has been extended to the village of Honeoye Falls, N. Y. and facilities for freight and passenger traffic provided. A connection with the Western New York & Pennsylvania R. R. at Wadsworth, N. Y. has brought an increase in traffic. At Buffalo, a short connection to the tracks of the Lake Shore & Michigan Southern R. R. has been built which eliminates much delay and a use of a portion of the Buffalo Creek R. R.

The practical trial of three years with rails of 45 foot lengths with mitre joints has proven so satisfactory that they have been adopted as standard for future use. Coal cars of 60,000 pounds capacity have been adopted as standard. The trucks were made of pressed steel plates known as the Fox trucks, the M. C. B. coupler and air brakes to be applied to all. 13,177 of the coal and freight cars have been equipped with the M. C. B. coupler and 8296 have been equipped with air brakes. All four wheel coal cars which required large repairs will be abandoned. This is due in part to connecting roads declining to accept these cars.

Mr. Theodore Voorhees, having resigned his position as General Manager, the office was discontinued last May and its duties devolved upon the General Superintendent. The impaired health of Mr. John Taylor, General Traffic Manager, necessitating relief for a time, Mr. Henry H. Kingston was appointed Assistant General Traffic Manager.

Messrs. Joseph Wharton, Thomas McKean and George H. Myers were elected Directors to succeed Messrs. Rollin W. Wilbur, William H. Sayre and Henry S. Drinker who resigned.

#### 1895

The report calls attention to the need of more economy in the conducting of the traffic. Although the road carried an increase of 1,070,898 tons of anthracite and bituminous coal, this resulted only in an increase of revenue of \$79,317.51 from this item. The tonnage of miscellaneous freights increased 1,166,740 tons and brought an increase in revenue from this item of \$866,204.54. The violation of national and state laws merely works a hardship on the public. This Company, with thirty others, which carry the bulk of the merchandise between the Atlantic seaboard and the Mississippi River and north of the Ohio and Potomac Rivers, have joined in the organization of the Joint Traffic Association. The management of the affairs of the Joint Traffic Associa-



tion is intrusted to a board of nine representatives of the constituent companies. Mr. John B. Garrett, Third Vice President of the Lehigh Valley R. R. is one of the nine representatives.

The Rochester Branch has been extended from Honeoye Falls, through a rich farming country to Hemlock Lake, a distance of 13.6 miles. The Middlesex Valley R. R., extending from Geneva to Naples, N. Y., a distance of 29 miles, has also been acquired. The Pennsylvania, Poughkeepsie & Boston R. R., lately sold under foreclosure, has been reorganized as the Lehigh & New England R. R. A contract entered into with the new company by which the Lehigh Valley continues to operate a portion of its line as formerly.

Under the terms of the reorganization of the Southern Central R. R., the Lehigh Valley R. R. acquired 60% of the preferred stock, being a majority of interest of the entire capital stock of the new corporation.

At Suspension Bridge the tonnage increased 108,582 tons over the year 1894. At Jersey City and Perth Amboy, the tonnage of miscellaneous freights (exclusive of coal and coke) increased 690,831 tons over the year 1894.

The continued drought entailed great expense in the hauling of water for the use of the shops, locomotives and collieries. For many weeks 800,000 gallons of water were hauled, using ten locomotives for this service. The city of Hazleton had to have its water supply augmented. Lack of water on the Mountain Cut-Off made it necessary to reduce the tonnage on all east bound trains causing an increase in the cost of operation and a delay in the movement of coal and freight over Wilkes-Barre Mountain. Although the line is double tracked, additional track facilities are needed and a comprehensive plan should be devised. The great volume of tonnage moved over the Lehigh Division between Mauch Chunk and Easton emphasizes the necessity, not only of additional sidings but of main tracks as well.

All cars have been equipped with the necessary hand holds and grab irons and draw bars are being raised to standard height to comply with the Act of Congress. This latter will be completed by Feb. 15th, 1896. The locomotives are being equipped with driver and train brakes and this work is expected to be completed on January 1st, 1898.

The report contains the announcement of the death of Mr. John R. Fell, a Director of the road since October 17, 1882. Mr. Fell died on November 15th, 1895. His father, J. Gillingham Fell was at one time President of the Lehigh Valley Coal Co. Mr. Eugene Delano was elected a Director to succeed Mr. Fell.

Mr. Henry H. Kingston was appointed General Traffic Manager to succeed Mr. John Taylor who died on November 2nd, 1895. Mr. Taylor had worked in various capacities during the whole history of the Lehigh Valley R. R.

#### 1896

The Hazleton and Beaver Meadow coal lands, being entirely distinct from railroad operations, are being operated under leases either by the Lehigh Valley Coal Co. or the Hazleton Coal Co. Due to the industrial stagnation the anthracite coal tonnage was less by 500,000 tons. For the first time in the history of this company the ton mileage of miscellaneous



freights had exceeded that of anthracite and bituminous coal and coke.

On February of this year the Board directed the purchase of the capital stocks of the companies forming the line of the Elmira, Courtland & Northern R. R., extending from Elmira to Camden, N. Y., a distance of 140 miles. The road has already been changed to the standard of the Lehigh Valley R. R.

The Greenville & Hudson Ry., connecting the road at Greenville with the Jersey City docks is under construction and when completed will do much to afford relief to the yard facilities at Jersey City.

On May 18th of this year, the "Black Diamond Express" was placed in service between New York and Buffalo. The train has proven to be very popular with the travelling public and has done much to attract passenger business to the road. The operation of dining and cafe cars has been satisfactory. The road also operates restaurants in the stations at Easton, Wilkes-Barre, Sayre and Geneva and these have also proved satisfactory. During the year a line of postal cars for the carrying of the United States mails between New York and Buffalo was established.

The new station at Pittston is completed and is now in use. All through trains are now run on the double-track line along the river front and the line through the city of Pittston now handles only local freights.

Experiments have been made this year of mixing bituminous coal with the smaller sizes of anthracite coal for locomotive fuel. No figures are included in this report but the officials of the Motive Power Department feel that there will be a considerable saving in the cost of fuel. The tonnage hauled by the locomotives increased during the past year 15%. Locomotives are now being weighed in accordance with the weight of the train and not by the number of cars. The standard rail has been changed from 80 to 90 pounds to the yard. The drought of last summer caused the road to improve the water supply at Hazleton and at Delano.

The Depew & Tonawanda R. R., was opened on November 15th of this year. All traffic destined for Suspension Bridge and west thereof and all eastbound traffic which was formerly delivered to and received from the New York Central R. R. at Batavia, now goes over the Lehigh Valley to Depew and thence over the new line to North Tonawanda, in all 39.62 miles as compared with the 36.35 miles of the New York Central R. R.

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Perhaps here it is just as well to conclude our narrative of the Lehigh Valley R. R. During these intervening years its management has continued to maintain and improve its property. The daylight trip over the road on the "Black Diamond Express" through the rugged Pennsylvania Mountains, the climb into or out of Wilkes-Barre and then through the rich farming sections of New York State will delight the eye of the tourist and the service is most certainly on a par with our other eastern roads. In more recent years much has been done to expedite its movement of freight and at the present time, this road with its connections at Buffalo forms an important route of our eastern trunk lines.

## MOTIVE POWER

In the roster of locomotives of the Lehigh Valley R. R., which will be found in the appendix of this bulletin, our members will note that save for the locomotives built in the company shops, the locomotives of the Baldwin Works and William Mason predominate. The road was faced with the movement of coal over heavy grades and had to accomplish this at a low cost. Consequently the officers in charge of the motive power were willing to try almost anything—once.

From an historical standpoint, it is an interesting fact that the locomotive "Samuel D. Ingham", built by Messrs. Garrett & Eastwick of Philadelphia for the Beaver Meadow R. R. and named for the President of that railroad was provided with a cab for the protection of the engine crew. This engine was built in 1836 and it would seem safe to assume that it was the first locomotive providing a shelter for its crew in the State of Pennsylvania.

Mr. Henry F. Colvin, one of the engineers of the Lackawanna R. R., in later years connected with the Rue Manufacturing Co. of Philadelphia, advised me of two more interesting engines owned by the Beaver Meadow R. R. These were named the "Defiance" and "Champion", were built by the Niles Co. of Cincinnati and purchased at a sheriff's sale in 1857. These locomotives were designed for service on an inclined plane and had a cog gearing for the rack rail. They had four pairs of drivers, no trucks and were outside connected. They had four cylinders, two inside the frames and two outside and were equipped with a radial motion, something very close akin to the Walschaert valve gear. These two locomotives gave very good service for a number of years on both the Beaver Meadow and the Lehigh Valley roads.

It appears to have been the policy of keeping the road in the early days, in small units, with their own officers and Master Mechanic who appeared to be a law unto himself. Whether the variety of locomotive builders, was a part of this program or whether the management was broadminded and believed in trying a few from each builder, it is difficult to say. The real reason may have been that the increasing coal traffic caused a steadily increasing number of locomotives and the road was obliged to purchase them where they could on short notice.

One of the early outstanding locomotives was produced by Alexander Mitchell, Master Mechanic of the Mahanoy Division and built by the Baldwin Locomotive Works. The engine was of the 2-8-0 type and named "Consolidation." Whether this name was due to the consolidation of the Lehigh & Mahanoy R. R. with the Lehigh Valley R. R. that year or whether the name was derived from the fact that this locomotive had four pairs of drivers, thus being a consolidation, so far as the drivers are concerned of two 4-4-0 engines, I will let our members draw their own conclusions. I have heard both theories advanced. So much has already been written about this famous locomotive that little need be said here. As built, the engine had 20x24" cylinders, 48" drivers and weighed 85,720 lbs. The grate area was 25.7 sq. ft., fitted with water tube grate and the engine had two pumps and one injector. It was the

forerunner of a famous class of locomotive which did fine service until the demand for speed in moving freight trains drove it into the discard.

In 1867, the road purchased from the Norris Bros. at Lancaster, Pa., two 2-10-0 or Decapod type of locomotives. These carried the names "Ant" and "Bee" and again Alexander Mitchell was responsible for their design. As built, these engines had 20x26" cylinders, 48" drivers, weighed 97,000 lbs. and had 28.7 sq. ft. of grate area. The sharp curves in the mountain divisions gave trouble with the long rigid wheel base and the last pair of drivers were removed, giving place to a pair of smaller wheels, virtually making these engines of the 2-8-2 type. However, so far as we can learn, the "Ant" and the "Bee" were the first two engines of the Decapod or 2-10-0 type built in this country.

With the close of the Civil War, giving the road a chance to improve its shop facilities, the Lehigh Valley embarked upon the program of constructing its engines in the different shops. At one time, sooner or later, engines were built at the Delano, Hazleton, Sayre, South Easton, Wilkes-Barre and Weatherly Shops. The Master Mechanics were permitted to build whatever type of locomotive he felt would do the best work on his division. While this may have been all right in theory, it gave the road a wonderful assortment of motive power, the like of which I don't believe was on any other American railroad either at that time or since. Train men were active partisans either to praise or abuse and frequently a design was built simply because it was different than the others. Some of these designs showed progress, others showed what had better to have left undone.

In 1869, David Clark, Master Mechanic at the Hazleton Shops built several engines of the 0-8-0 type. These engines had 20x24" cylinders, 48" drivers and weighed 88,000 lbs. They did very good work in freight service. David Clark fitted a number of his engines with a link motion and independent cut-off valve. This gear had six eccentrics, four rocker shafts, two reversing rods, two additional valves, valve seats, valve stems, etc. It is reported that these engines probably gave the best indicator diagrams ever made by a locomotive but it was difficult to find any saving in fuel. Mr. Clark also constructed the first engine with a Wooten firebox for the road—the "John R. Fanshawe" #357.

In 1880, Philip Hoffeecker, Master Mechanic of the Weatherly Shops, with a view of improving on Mitchell's 2-10-0 engines, brought out the "Champion", a twelve-wheel or 4-8-0 type. This engine had 20x26" cylinders, 48" drivers and weighed 101,696 lbs. It had 32 sq. ft. of grate, carried 125 pounds pressure and developed 23,000 lbs. tractive effort. The engine was about the same weight and dimensions of the consolidation type then in service.

In 1886 a locomotive of the 4-6-2 or "Pacific" type was built in the Wilkes-Barre Shops. Built under patents granted to George S. Strong, the boiler was of the so-called "pant-leg" type with two corrugated cylindrical fireboxes joined together to form one combustion chamber in front. The cylinders were of special design and had grid iron steam and exhaust valves which allowed a large port opening with short valve travel. The locomotive was numbered 444 and tried out on

several railroads before finally being placed in service on the heavy grades of the Wyoming Division. Perhaps not a success, the locomotive deserves mention here because it was the first Pacific type built in this country and it shows the leeway which the different Master Mechanics of the road had.

Since the late eighties, the Lehigh Valley has been content to follow the beaten path in the matter of locomotive design. Locomotives were built in the Sayre Shops up to the time of the World War but the other shops have long since ceased to build any locomotives. The Wootten type of firebox prevailed until Federal regulations caused it to be abandoned.

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The Reports of the Lehigh Valley R. R. contain much that is of interest to the student of railway history. One of the most interesting of these is the introduction and use of the steel rail. In common with other roads, the Lehigh Valley experienced trouble with increasing weight of trains on the iron rail. In the report of 1864, we find first mention of the fact that the road has laid 3,680 feet of steel rails on the Beaver Meadow Division and that some doubts existed in the minds of the officials in the matter of its adhesive qualities compared with that of iron. Actual tests proved that there was no difference. In the report of 1870, Mr. Sayre states that during the year previous 1,530 tons of the best English iron rails, guaranteed to last from 5 to 7 years have already been found unsatisfactory. Mr. Sayre recites the following as convincing proof that nothing but steel or steel headed rails will stand up under the heavy traffic. At Packerton Scales, where the coal cars pass over the scales and are weighed, the first iron rails laid upon the scales lasted one year, twenty three days and carried a passing tonnage of 2,263,675.08 tons. The second set of iron rails were in use seven months, nineteen days and carried a passing tonnage of 1,524,870.03 tons. On May 28, 1869, steel rails were laid on the scales, they have already been down 1½ years, have carried a passing tonnage of 5,509,381.02 tons and show no perceptible wear at this time. When the new scales were put in at Packerton in June, 1872, these same rails were laid just above the scales, where all the coal would pass over them. By 1875 these rails had carried 24,298,568 tons, by 1879 they had carried 45,746,738 tons and were still in good condition, by 1881 this tonnage had mounted to 59,531,115 and these are the last figures given. They seem to be conclusive in the use of the steel rail.

In the Report of 1861, Robert Sayre makes some very interesting remarks in connection with the standardization of equipment.—“The great economy of having the different class engines employed of uniform pattern is so evident that I would much prefer it (even if they were inferior in some particulars) to having a dozen different patterns with all the so-called improvements. Of 20 locomotives now in use, 4 are exactly alike, and consequently require but a single duplicate piece of any part liable to wear out or break to be kept on hand. The remaining

16 engines are of 12 different patterns, requiring 12 duplicate parts or pieces to be kept on hand. By referring to the annexed table of engine statistics you will perceive that the average mileage of the 4 Mason engines was 23,235 miles, at a cost of repairs of 4.78 cents per mile, while the average mileage of the 6 other engines performing the same kind of service was 12,651 miles at a cost of 11.66 cents per mile. A part of the great difference is due to the fact that the first named engines have not been so long in service, and are of superior workmanship, but much of it is in consequence of the uniformity of pattern." From what we have already seen, it is apparent that Mr. Sayre had nothing to do with the Motive Power Department, but his views in the matter of standardization of equipment are sound as has been demonstrated in recent years.

In 1865 mention is made of the use of steel locomotive tires. These were first probably applied in 1864. Two tires failed, one after completing 36,000 miles, the other running only a short time. On the other hand, the steel tires of the engine "Easton" have made 48,000 miles and show only but a trifle over one-eighth of an inch wear. Sixteen engines are equipped with steel tires to date. Furthermore, fire-box plates are being made of steel and fifty steel axles have been ordered for the passenger cars. At one time, during the year 1864, the price of locomotives rose to the enormous price, for those days, of \$34,500.00 each. The first steel fire-box was used in January, 1862 and five years later was reported as being in good condition and had not failed in the interim.

Confronted with the difficulty of getting good cast iron wheels for locomotive trucks, Mr. Sayre tried a cast iron center with steel tire. These were first tried in 1867. This was evidently the start of the road making their own wheels. The Report for 1881 states that at the Hazleton Foundry there were cast a total of 14,246 wheels of all kinds.

By 1880 the road had adopted the general policy of increasing the weight of the wheels, the size of the axle and journal in order to carry a larger load of coal per car. For this year the standard capacity of all of their freight cars and eight wheel coal cars was forty thousand pounds. The Report for 1881 gives us an idea as to the amount of equipment manufactured and repaired at the various shops—thirteen new locomotives were built as were also three passenger cars, three baggage cars, 412 eight-wheel gondola cars, 465 eight-wheel house cars, 100 lumber house cars and 62 other cars of different types. At Packerton Shops, there were built, to replace cars worn out and broken up, a total of 451 freight cars of different types. There were 609 freight cars of different types built for other parties. In all of the different shops, during the year, there was a total of 185,779 cars of all kinds repaired during the year. This will give us an idea of the amount of equipment required to handle the coal traffic and the manufacturing and repairing of equipment.

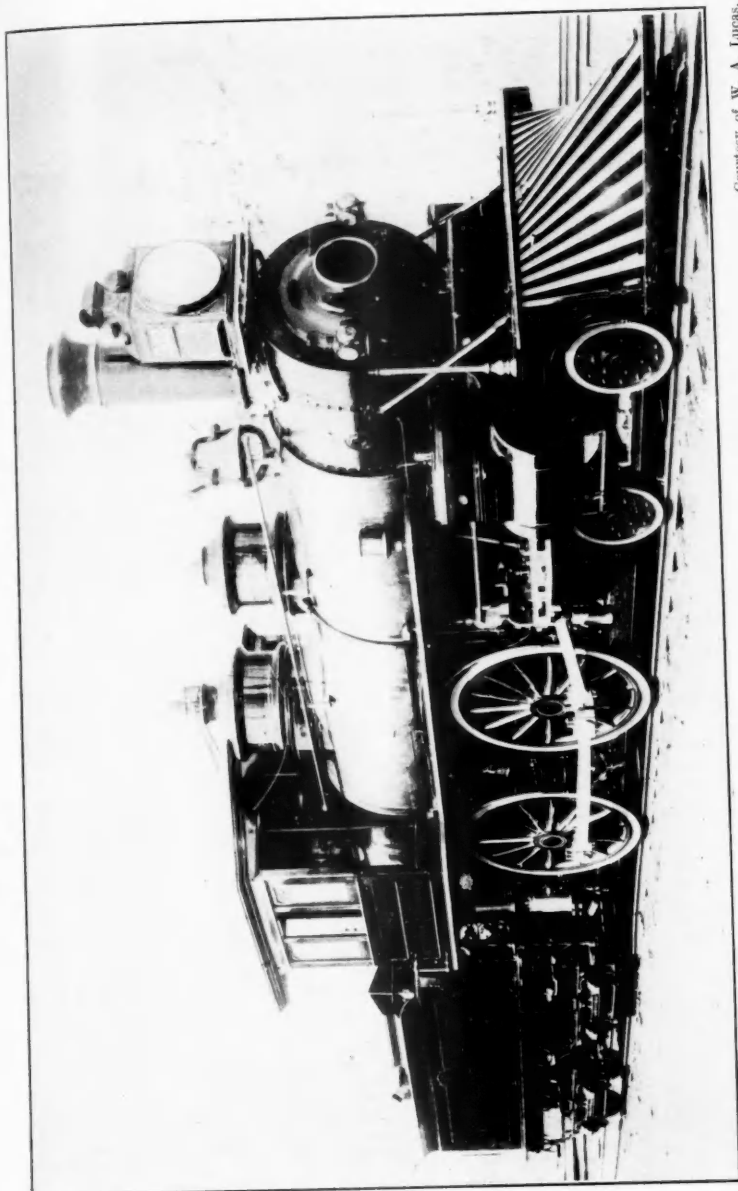
The Report for 1882 discloses that 1 locomotive was built in the South Easton Shops; 1 at the Wilkes-Barre Shops; 6 at the Delano Shops; 10 at the Hazleton Shops and 5 at the Weatherly Shops. In the same year the Hazleton foundry cast 1788 wheels for mine cars, 14,967 for general use and 45 locomotive tires. The first mention of locomotives

being built in the Sayre Shops is in the year 1887 when two eight-wheel connected freight engines, we assume they were of the 2-8-0 type were completed that year.

The Pennsylvania & New York Canal & Railroad Co., which comprised the western end of the Lehigh Valley R. R., extending from Wilkes-Barre to Waverly, N. Y., 133 miles of line, became an integral part of the Lehigh Valley R. R. in 1888. With the exception of a few shares, the Lehigh Valley R. R. had the entire stock ownership in the road. Effective December 1, 1888, the road was leased to the Lehigh Valley R. R. for ninety-nine years. The Pennsylvania & New York Canal & Railroad Co. had their own locomotives and the report gives the number as an even one hundred that were added to those of the Lehigh Valley. This report also gives the length of lines without second track or sidings:

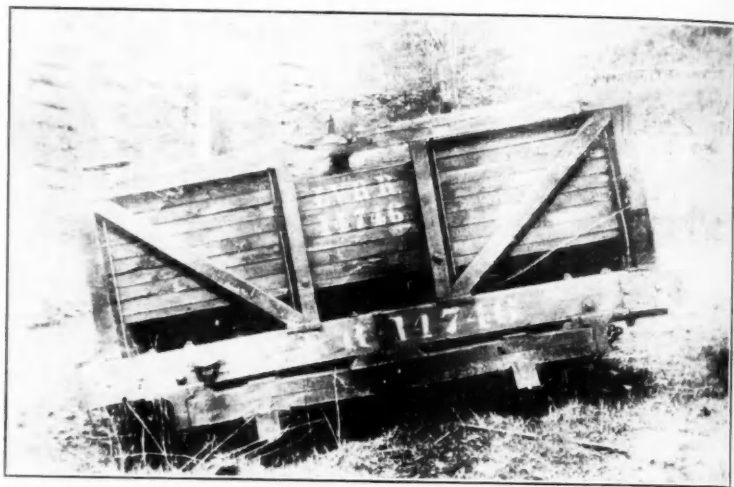
Lehigh Valley R. R. ....	382 miles
Pa. & N. Y. Canal & R. R. (including leased lines) .....	180 "
Geneva, Ithaca & Sayre R. R. ....	116 "
Southern Central R. R. of New York .....	114 "
Lehigh Valley Ry. of New York .....	12 "
Total .....	804 miles

In addition to the above, the Lehigh Valley trains operated over 50 miles of Pennsylvania R. R. tracks; 15 miles over the New York Central & Hudson River R. R. tracks; 188 over the New York, Lake Erie & Western R. R. tracks and 21 miles over the Central R. R. of New Jersey tracks making a total of 1078 miles covered by the Lehigh Valley trains. As we have already seen, use of the New York, Lake Erie & Western tracks was discontinued in 1892 when the Lehigh Valley R. R. completed their own line from Van Etten and Geneva to Buffalo. Edward H. Mott in his book—"The Story of the Erie" states that the latter company prepared to change their gauge from six feet to standard gauge in 1874 when 114 miles were put down and that standard gauge equipment was running between Jersey City and Buffalo by December 29, 1878. The real reason for the Lehigh Valley building their road into Buffalo was not on account of the difference in gauge between the New York, Lake Erie & Western Ry. and the Lehigh Valley, but to get rid of the excessive charges of the former. For the year 1891, the Lehigh Valley R. R., paid the New York, Lake Erie & Western R. R., one and one-quarter million dollars for the privilege of moving their own freight, in their own cars with their own power over the tracks of the latter! One could hardly blame them for wanting to get away from any such arrangement as that. The completion of the line to Buffalo gave the road the western outlet for their business they sorely needed and rounds the system out to a busy coal carrying road from the mines to the eastern seaboard, the Great Lakes and to the many connecting carriers.



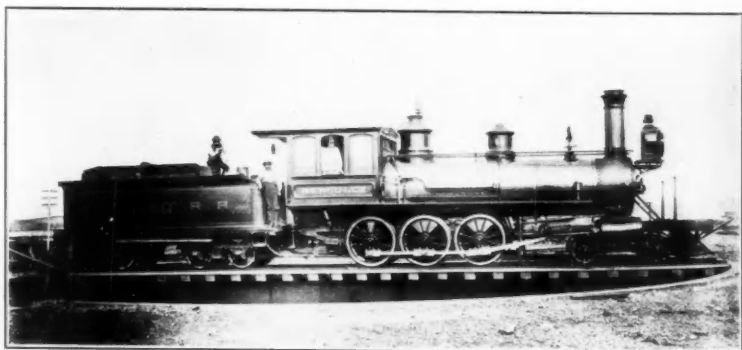
L. V. 382 "Wm. Conyngham," Wilkes-Barre Shops 1882.

Courtesy of W. A. Lucas.



One of the old coal "jimmies."

Courtesy of Clinton T. Andrews.



L. V. 60, "Hercules." South Easton Shops 1885. Note the similarity to the Mason engines.

Courtesy of W. A. Lucas.



## BEAVER MEADOW R. R.

Some of the roads making up the present Lehigh Valley R. R. deserve a word of mention relative to their history and among them was the Beaver Meadow Rail Road & Coal Co. The company was chartered April 7, 1830 to build a railroad up the Beaver, Hazle and Quakake Creeks to the Lehigh River and then follow that river to Parryville. Construction was started in 1833 and the road was opened for traffic in the fall of 1836. It was the first railroad in Carbon County, Pennsylvania, to use steam for motive power.

The officers were S. D. Ingham, President; John Ecky, Secretary; Morris Hall, Treasurer; Canvas White, Chief Engineer with A. Pardee his assistant and Hopkin Thomas, Master Mechanic. The surveys were made and the line graded and built under the direction of Mr. Pardee who succeeded Mr. White. The road encountered difficulties in construction due to the action of the Lehigh Coal & Navigation Co. and at one time the men of both companies carried arms to enforce their rights. The matter was settled peaceably but at the expense of the Beaver Meadow R. R. Trouble in the matter of tolls with the Lehigh Coal & Navigation Co. caused them to extend the road to Parryville and this point was made the shipping center.

The shops, originally located at Beaver Meadow, were removed to Weatherly in the summer of 1839. They were located near the site of the present Town Hall and were driven by water power.

The freshet of January, 1841, destroyed all of the bridges between Weatherly and Parryville, together with the docks at the latter point and almost all of the road to Mauch Chunk. All of the bridges on Quakake Creek were lost as well as the Turnhole bridge crossing the Lehigh River. The road was rebuilt under the direction of A. H. Nancleave, Superintendent and the road was again opened for traffic in August, 1841, but the line between Mauch Chunk and Parryville was not rebuilt and shipping facilities were built at Mauch Chunk.

The road included two self-acting inclined planes, rising one foot in 11.20 and the length of the planes was 2200 ft. Two engines were used above the planes of 7 tons weight, each of six wheels with one pair of drivers. Three engines were used below the planes, two of them weighed 13 tons each and all of the weight was on three pairs of drivers.

In 1849 it was decided to replace the light wooden rail with a flat bar of iron fastened thereto with heavy T rail. This was done during the winter of 1849 and the work was completed in May or June, 1850.

In September, 1850, occurred another disastrous flood, carrying away all bridges on the Black and Quakake Creeks, destroying the shops at Weatherly as well as a large portion of the right of way between Weatherly and Penn Haven. Repairs were not completed until the spring of 1851.

In 1854 it was decided to abandon the use of the incline planes. Land was purchased from the Hazleton Coal Co. and the line known as the Weatherly Hill was built. This  $1\frac{3}{4}$  miles of line has a grade of 145 feet to the mile out of Weatherly and 135 feet to the mile for a further

distance of 4000 feet. It has witnessed many a thrilling runaway! The inclined planes were abandoned on Aug. 14, 1855. This new line caused the shops to be moved to the east side of the creek, their present location.

The laying of a second track between Mauch Chunk and Penn Haven, along the Lehigh River, July or August, 1857, caused the old Turnhole bridge with its two severe curves to be abandoned. A new double track iron bridge replaced the old structure.

At the time the Beaver Meadow R. R. was opened in 1836 between Beaver Meadow and Parryville, the road owned two locomotives—"S. D. Ingham" and "Elias Eley." Both were built that same year by Messrs. Garrett & Eastwick of Philadelphia, Pa. Both were of the eight-wheel type and were equipped with a peculiar reversing device that originated with Mr. Andrew M. Eastwick in that the reversing was done by a block sliding on the valve seats, intervening between the valve seat and slide valve in such a way that it acted as a reversing gear. The "Ingham" had the Bury type of boiler, inside frames and outside cylinders, moreover, it had a deck covering to afford protection to the enginemen and was the first locomotive to have such a shelter in the State of Pennsylvania. One other locomotive was built by Messrs. Garrett & Eastwick in 1836—the "Quakake", but delivery apparently was not made until April, 1837. In August, 1837, the "Beaver" was delivered by Messrs. Garrett & Eastwick. Some authorities state the "Beaver" was the first four wheel connected locomotive built in the State of Pennsylvania. It was more powerful than the three other engines as the U. S. Report of 1838 gives it as 26 horse power, the other three of 18 horse power each. The U. S. Report of 1838 indicates that the "Nonpareil" was built by Messrs. Garrett & Eastwick in 1837 and it would indicate a similarity with the "Beaver." Another source of information indicates that an engine of this name was constructed by Hopkin Thomas in the shops of that company in 1837-38 and was a six wheel connected engine. Angus Sinclair in his "Development of the Locomotive Engine" mentions the "Hercules" as being built by Messrs. Garrett & Eastwick, which was of the 4-4-0 type and which used a separate frame with pedestals for carrying the drivers. This frame had a center bearing and could move like a truck but could not turn. This frame was underneath and separated from the main frame by side bearing springs. This arrangement allowed the engine to adjust itself to the unevenness of the track but the device was not without its faults. However, the engine was an improvement and more were ordered similar to it but how many and what their names were, we are unable to say.

The records of the Baldwin Locomotive Works indicate they furnished the following engines to the Beaver Meadow R. R.:

Amazon	B. L. W.	#: 647	June 25, 1855	16x20"	42"	22 tons
James M. Porter		#: 652	July 30, 1855	16x20"	42"	22
Orinoco		#: 656	Aug. 22, 1855	16x20"	42"	22
La Plata		#: 695	Apr. 30, 1856	16x20"	42"	22
Colorado		#: 697	May 15, 1856	16x20"	42"	22
Paraguay		#: 702	June 7, 1856	16x20"	42"	22
Alps		#: 748	Mar. 24, 1857	17x20"	42"	25
Atlas		#: 750	Mar. 30, 1857	17x20"	42"	25

Messenger #20	#1103	Dec. 31, 1862	18x22"	48"	28
Mercury #21	#1104	Jan. 15, 1863	18x22"	48"	28
Meteor #22	#1114	Feb. 28, 1863	18x22"	48"	28
Vulcan #23	#1256	July 9, 1864	16x24"	60"	27.5
Neptune #24	#1265	July 30, 1864	16x24"	60"	27.5
Tuscarora #45	#1333	Feb. 6, 1865	18x22"	54"	28
Algonquin #46	#1345	Mar. 10, 1865	18x22"	54"	28

The first eight engines on the above list had four pairs of drivers, the balance had three pairs of drivers.

In closing, mention should be made of Mr. Philip Hoffecker. He succeeded Hopkin Thomas as Master Mechanic in the early fifties. Under his supervision many fine locomotives were constructed in the Weatherly shops, not only while he was connected with the Beaver Meadow R. R., but in later years when the road was operated by the Lehigh Valley. On July 8th, 1864, the Lehigh Valley assumed control of the Beaver Meadow R. R. and thus this interesting little road became a part of this important coal carrier.

### LEHIGH & MAHANoy R. R.

This road, extending from Black Creek Jct. to Mt. Carmel, a distance of 40 miles, was merged with the Lehigh Valley R. R. in 1866. The original portion of this line in Carbon County was first graded by the Morris Canal & Banking Co. in 1837. The road was scarcely completed and placed in operation when it became financially embarrassed, the rails were taken up and shipped to Pottsville, Pa. The records of the Baldwin Locomotive Works indicate they built ten engines for this road:

#1 Mahanoy	B. L. W.	#1151	July 8, 1863	17½x22"	48"	26.5 tons
#2 Shenandoah		#1152	July 15, 1863	17½x22"	48"	26.5
#8 Mt. Carmel		#1337	Feb. 21, 1865	18x22"	54"	28
#5 Centerville		#1393	July 11, 1865	15½x22"	60"	24.5
#9 Carbon		#1396	July 20, 1865	18x22"	54"	28
#10 Columbia		#1422	Nov. 20, 1865	18x22"	54"	28
#11 Northumberland		#1431	Dec. 8, 1865	18x22"	54"	28
#12 Mt. Etna		#1481	Apr. 27, 1866	18x22"	54"	28
#10 Schuylkill		#1490	June 7, 1866	18x22"	54"	28
#63 Consolidation		#1500	July 20, 1866	20x24"	*	34

\*Drivers 48¾"

All engines were of the 4-6-0 type save the "Centerville", evidently a 4-4-0 and the "Consolidation" which was a 2-8-0.

### HAZLETON R. R.

This road connected Hazleton with Penn Haven, a distance of 14 miles. Work was started in 1836 and by 1838 Weatherly was reached where it connected with the Beaver Meadow R. R. The Beaver Meadow R. R. was used by the Hazleton R. R. from 1838 to 1852 but after the freshet of 1850, the Hazleton R. R. located and built the road from Hazle creek to the top of the mountain at Penn Haven. Here, by means

of inclined planes which were 430 ft. high and 1200 ft. long, coal cars were made to descend these planes to the coal pockets from which the boats were loaded. In 1859 another plane was built and the cars were let down on a level with the Beaver Meadow R. R., over which they were conveyed to the Lehigh Valley R. R. to Mauch Chunk and thence to market. These planes were abandoned after the freshet of 1862 that destroyed the canal above Mauch Chunk. The shops of the road were at Hazleton and Mr. David Clark was Master Mechanic. The Hazleton R. R. was merged with the Lehigh Valley R. R., May 25, 1868.

### LEHIGH VALLEY R. R. LOCOMOTIVES

Through the kindness of our members, Mr. Clinton T. Andrews and the Baldwin Locomotive Works, I am able to furnish our readers with a complete list of all of the Lehigh Valley R. R. locomotives that carried names.

1	?	Baldwin	1852		12x18"	42"
1	New York	Delano Shop	1869	2-6-0	18x24"	61½"
2	Asa Packer	Baldwin	#659 1855	0-8-0	16x20"	42"
2	Asa Packer	S. Easton	1872	4-4-0	18x24"	60"
3	Henry King	R. Norris & Son	1855	4-6-0	15x24"	48"
3	Henry King	New Jersey L & M	1864	4-4-0	16x24"	60"
Bought at sheriff sale—Feb. 26, 1874 from New Jersey Southern R R						
3	Niagara	S. Easton	1870	4-4-0	19x24"	69"
4	Robert H. Sayre	R. Norris & Son	1855	4-6-0	15x24"	48"
4	Robert H. Sayre	S. Easton	1874	4-4-0	18x24"	66"
5	Delaware	R. Norris & Son	1855	4-4-0	13x24"	60"
5	David Laury	S. Easton	?	4-4-0	19x24"	69"
6	Vulcan (then Alps)	Danforth & Cook	1857	0-4-0	14x22"	44"
6	Hornet	Beaver Meadow R R	1856	4-4-0	14x24"	60"
6	Wilkes-Barre	Rhode Island	1874	2-6-0	18x26"	54"
7	Atlantic	R. Norris & Son	1855	4-4-0	15x26"	54"
7	Atlantic	Weatherly	1873	4-4-0	17x24"	60"
7	Albert E. Lewis	Wilkes-Barre	1889	4-4-0	19x24"	66"
8	Pacific	R. Norris & Son	1855	4-4-0	15x26"	54"
8	Pacific	Weatherly	1867	4-4-0	16x24"	60"
9	Reliance	Sold to Penna & N. Y. R. R.	Reb—Weatherly	11-1882		
10	Baltic	Mason	43 1856	4-4-0	15x22"	60"
10	Baltic	Beaver Meadow RR	1856	4-4-0	15x26"	54"
11	E. A. Packer	Weatherly	1874	4-6-0	18x26"	48"
12	New Jersey	Mason	51 1856	4-4-0	16x22"	60"
13	Pennsylvania	Trenton L W	1856	4-4-0	16x24"	54"
		Reb—S. Easton	1872	4-4-0	18x24"	60"
			Reb—S. Easton	4-1869 & 7-1884		
			1857	4-4-0	16x24"	54"
			1873	4-4-0	18x24"	60"
				Reb—S. Easton	1-1887	

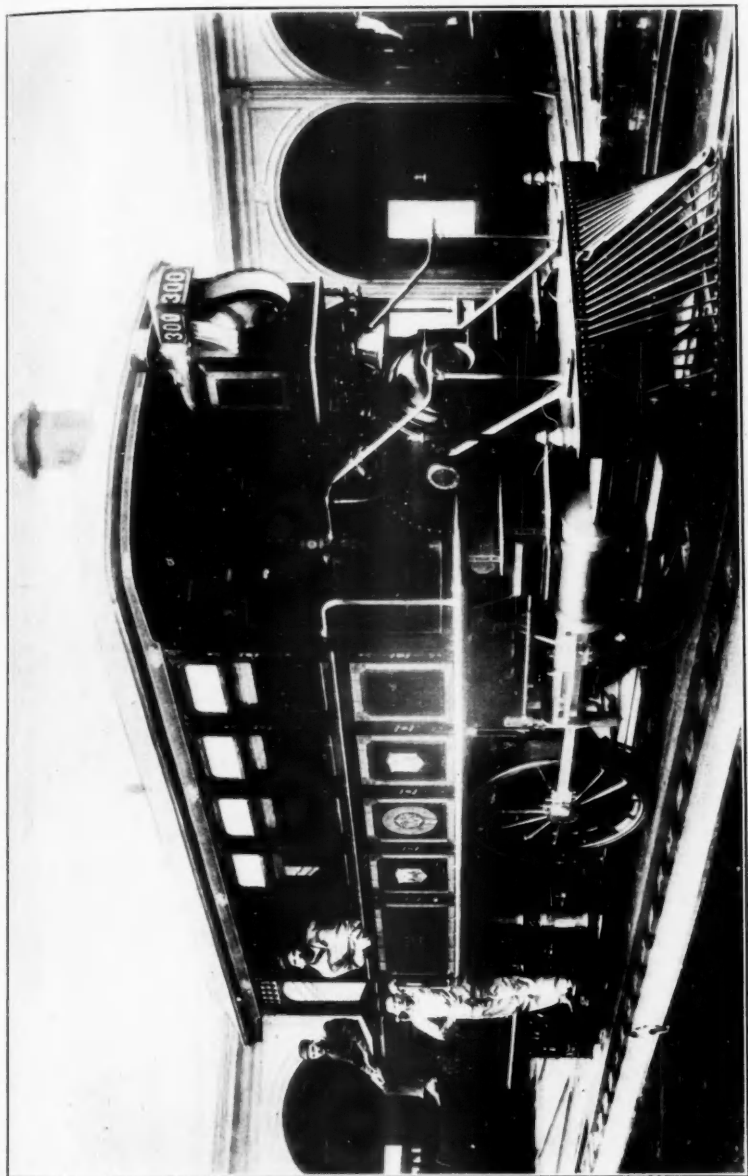
14 Catasaqua	Norris & Son	1857	4-6-0	17x24"	48"
				Destroyed	5-16-1862
14 Catasaqua	S. Easton	1879	4-4-0	18x22"	56"
15 Lehigh	Norris & Son	1857	4-6-0	17x24"	48"
	Reb— S. Easton	1878	4-4-0		
16 Atlas	Baldwin	#750	1857	0-8-0	17x20"
			Reb—	0-4-0	42"
16 Atlas	Weatherly		1872	4-8-0	20x26"
				Reb—Weatherly	1892
17 Alps	Baldwin	748	1857	0-8-0	17x20"
			Reb—	0-4-0	42"
17 Beaver	Weatherly		1869	4-4-0	17x24"
				Reb—Weatherly	7-1885
18 Seneca	A. Pardee		1857	4-4-0	16x22"
	Hazleton R. R.				44"
18 Seneca	Rhode Island		1874	2-6-0	18x26"
				Reb—S. Easton	11-1888
19 Defiance	Niles & Co.		1858	0-8-0	16x20"
20 Champion	Niles & Co.		1859	0-8-0	16x20"
20 Champion	Weatherly		1880	4-8-0	20x26"
21 Bushkill	Mason	86	1859	4-6-0	17x24"
22 Saucon	Mason	87	1859	4-6-0	17x24"
23 Monocacy	Cooke & Co.		1859	4-4-0	12½x22"
24 Lilliput	Mason	115	1862	4-2-4	14x22"
24 Little Lehigh	D. Cooke & Co.		1859	4-4-0	12½x22"
				Sold to P & N Y R R	
24 Alaska	S. Easton		1885	4-4-0	18x24"
25 Easton	Mason	95	1860	4-6-0	17x24"
26 Mauch Chunk	Mason	97	1860	4-6-0	17x24"
27 Bethlehem	Mason	110	1862	4-6-0	17x24"
28 Allentown	Mason	111	1862	4-6-0	17x24"
29 Slatington	Baldwin	1071	1862	4-6-0	17½x24"
30 Sugar Notch	Dickson		1868	0-6-0	15x16"
31 Parryville	Mason	118	1862	4-6-0	17x24"
32 Lehigh	Mason	120	1862	4-6-0	17x24"
33 Wyoming	Baldwin	1062	1862	4-4-0	13x24"
				Sold to P & N Y R R	
33 Passaic	Baldwin	3598	1874	4-6-0	18x24"
34 Messenger	Baldwin	1103	1862	4-6-0	18x22"
34 John M. Rahn	Weatherly		1886	4-4-0	20x24"
35 Mercury	Baldwin	1104	1863	4-6-0	18x22"
36 Meteor	Baldwin	1114	1863	4-6-0	18x22"
37 Penn Haven	Mason	129	1863	4-6-0	17x24"
38 White Haven	Mason	132	1863	4-6-0	17x24"
39 Nescopec	Mason	144	1863	4-6-0	17x24"
40 Nanticoke	Mason	146	1863	4-6-0	17x24"
41 Vulcan	Baldwin	1256	1864	4-6-0	18x22"
41 Ocean	Baldwin	3599	1874	4-6-0	18x24"
42 Neptune	Baldwin	1265	1864	4-6-0	18x22"
43 Quakake	Mason	173	1864	4-6-0	17x24"
44 Nesquehoning	Mason	174	1864	4-6-0	17x24"
45 Tuscarora	Baldwin	1333	1865	4-6-0	18x22"
46 Algonquin	Baldwin	1345	1865	4-6-0	18x22"
47 Antelope	Mason	194	1865	4-4-0	16x22"
48 Reindeer	Mason	195	1865	4-4-0	16x22"
49 Centralia	Mason	176	1864	4-6-0	17x24"
50 Montezuma	Baldwin	1410	1865	4-6-0	18x22"
50 Montezuma	S. Easton		1882	4-6-0	18x24"
51 Saranac	Baldwin	1415	1865	4-6-0	18x22"
52 Northampton	Mason	221	1865	4-6-0	17x24"
53 Carbon	Mason	222	1865	4-6-0	17x24"

54 Cherokee	Baldwin	#1458	1866	4-6-0	18x22"	54"
55 Seminole	Baldwin	1463	1866	4-6-0	18x22"	54"
56 Gazelle	McKay & Aldus		1866	4-4-0	15x22"	60"
				Sold—P & N Y R R		
56 Essex	Baldwin	3600	1874	4-6-0	18x24"	50½"
57 Aramingo	Baldwin	1465	1866	4-6-0	18x22"	54"
58 Arasapha	Baldwin	1467	1866	4-6-0	18x22"	54"
59 Sampson	McKay & Aldus		1866	0-6-0	16x22"	48"
60 Hercules	McKay & Aldus		1866	0-6-0	16x22"	48"
60 Hercules	S. Easton		1885	4-6-0	18x24"	51"
61 Towanda	McKay & Aldus		1866	4-6-0	18x22"	54"
62 Tioga	McKay & Aldus		1866	4-6-0	18x22"	54"
63 Consolidation	Baldwin	1500	1866	2-8-0	20x24"	48¾"
64 Mahanoy	Baldwin	1151	1863	4-6-0	17½x22"	48"
65 Shenandoah	Baldwin	1152	1863	4-6-0	17½x22"	48"
66 Delano	Baldwin		1864	4-4-0	15½x22"	60"
67 Junction	Norris-Lancaster		1864	4-4-0	15x22"	54"
68 Centerville	Baldwin	1393	1865	4-4-0	15½x22"	60"
68 Centerville	L. V. R. R. (?)		1875	4-4-0	16½x22"	60"
68 Phillip Hofferker	Delano		1885	4-4-0	18x24"	62"
69 Shamokin	Grant		1865	2-6-0	18x24"	50"
69 Shamokin	L. V. R. R. (?)		1874	2-6-0	18x24"	50"
				Reb—Delano 6-1882		
70 Sunbury	Grant		1865	2-6-0	18x24"	50"
71 Mt. Carmel	Baldwin	1337	1865	4-6-0	18x22"	54"
				Reb—Weatherly 5-1879		
72 Montana	Baldwin		1865	4-6-0	18x22"	54"
				Reb—Delano 8-1884		
73 Columbia	Baldwin	1422	1865	4-6-0	18x22"	54"
				Reb—Delano 2-1884		
74 Northumberland	Baldwin	1431	1865	4-6-0	18x22"	54"
				Reb—Delano 11-1884		
75 Mt. Aetna	Baldwin	1481	1866	4-6-0	18x22"	54"
				Reb—Delano 9-1886		
76 Schuylkill	Baldwin	1490	1866	4-6-0	18x22"	54"
				Reb—Delano 8-1887		
77 Com. Stockton	Baldwin	1628	1867	2-8-0	20x28"	49½"
				Reb—W-Barre 5-1888		
78 J. M. Porter	Baldwin	1633	1867	2-8-0	20x28"	49½"
				Reb—W-Barre 9-1884		
79 Ajax	Baldwin	1644	1867	2-8-0	20x28"	49½"
				Reb—Delano 7-1892		
80 Achilles	Baldwin	1650	1867	2-8-0	20x28"	49½"
				Reb—Delano 7-1891		
81 Ant	Norris-Lancaster		1867	2-10-0	20x26"	48"
	Reb—L. V. R. R.			4-8-0		
82 Bee	Norris-Lancaster		1867	2-10-0	20x26"	48"
	Reb—L. V. R. R.			2-8-2		
83 Advance	Delano		1868	2-6-0	17x24"	61"
				Reb—Delano 10-1879		
84 Anthracite	S. Easton		1868	4-4-0	17x22"	60"
(First engine built at S. Easton)				Reb—S. Easton 2-1880		
85 J. O. Stearn	Baldwin	1689	1867	2-8-0	20x24"	49½"
86 Newport	Baldwin	1684	1867	4-6-0	18x22"	54"
				Reb—S. Easton 6-1880		
87 Little Giant	Baldwin	1726	1868	4-6-0	16x22"	44"
				Reb—S. Easton 2-1892		
88 Comanche	Baldwin	1734	1868	4-6-0	18x22"	54"
				Reb—S. Easton 4-1880		
89 Chippewa	Baldwin	1737	1868	4-6-0	18x22"	54"
				Reb—S. Easton 10-1887		

90 Merger	Hazleton	1868	0-6-0	14x22"	44"
				Sold P & N Y R R	
90 Warren	Baldwin	# 3601 1874	4-6-0	18x24"	50 1/4"
				Reb—S. Easton	5-1888
91 Pequea	Hazleton	1868	0-6-0	16x22"	44"
				Reb—Hazleton	4-1886
92 Jeddo	Hazleton	1869	0-6-0	16x22"	44"
				Reb—Hazleton	7-1885
93 Eagle	Norris-Lancaster	1868	4-4-0	17x22"	61 1/2"
				Sold P & N Y R R	
93 Somerset	Baldwin	3606 1874	4-6-0	16x24"	50 1/4"
				Reb—S. Easton	3-1889
94 W. W. Longstreth	Weatherly	1868	4-4-0	17x24"	60"
				Sold P & N Y R R	
94 Hunterdon	Baldwin	3607 1874	4-6-0	18x24"	50 1/4"
				Reb—S. Easton	2-1889
95 Serida	R. Norris & Son	1868	4-6-0	18x22"	54 1/4"
				Reb—S. Easton	10-1874
96 Nevada	R. Norris & Son	1868	4-6-0	18x22"	54"
				Reb—S. Easton	10-1874
97 Mountaineer	Baldwin	1809 1868	4-6-0	18x24"	49"
98 Dacotah	Baldwin	1810 1868	4-6-0	18x22"	54"
				Reb—W-Barre	7-1885
99 Coal Ridge	Baldwin	1811 1868	2-8-0	20x24"	48"
				Reb—Delano	11-1892
100 Trevorton	Baldwin	1812 1868	2-8-0	20x24"	48"
				Reb—Delano	10-1889
101 Wyoming	Hazleton R. R.	1856	4-4-0	16x22"	44"
101 Cayuga	Hazleton	1870	0-6-0	17x22"	44"
	Renamed Ebervale	1886			
102 Oneida	Hazleton R R	1856	4-4-0	16x22"	44"
102 Oneida	Hazleton	1876	4-6-0	19x24"	55 1/2"
				Reb—Hazleton	11-1887
103 Humbolt	Hazleton	1870	0-8-0	20x24"	48"
104 Ontario	Hazleton R R	1856	4-4-0	17x22"	44"
104 W. H. Sayre	Hazleton	1876	4-4-0	18x22"	62"
105 Cayuga	Hazleton R R	1858	4-4-0	17x22"	44"
105 Hazleton	Hazleton	1870	0-8-0	20x24"	48"
106 Champlain	Hazleton R R	1859	4-4-0	17x22"	44"
106 Champlain	Hazleton	1876	4-6-0	19x24"	55 1/2"
				Reb—Hazleton	12-1887
107 Huron	Hazleton R R	1861	4-4-0	17x22"	44"
107 Harleigh	Hazleton	1871	0-6-0	16x22"	44"
				Reb—Hazleton	12-1886
108 Oswego	Hazleton R R	1861	0-6-0	13x22"	44"
108 Geo. C. Thomas	S. Easton	1891	4-4-0	19x24"	69"
109 Superior	Hazleton R R	1861	0-6-0	14x22"	44"
110 Erie	Hazleton R R	1862	4-4-0	13x22"	54"
111 Geneva	Hazleton R R	1862	0-6-0	14x22"	44"
112 Hudson	Hazleton R R	1863	0-6-0	14x22"	44"
113 Idaho	Hazleton R R	1863	4-6-0	17x24"	54"
114 Drifton	Hazleton	1871	0-6-0	17x22"	44"
				Sold P & N Y R R	
114 Ontario	Hazleton	1877	0-6-0	17x22"	44"
				Reb—Hazleton	7-1889
115 Active	Hazleton R R	1864	0-6-0T	13x22"	44"
116 Agile	Hazleton R R	1864	0-6-0T	13x22"	44"
117 Lark	Hazleton R R	1864	4-6-0	17x24"	54"
118 Dexter	Hazleton R R	1865	4-6-0	17x24"	54"
119 Lattimer	Hazleton	1869	0-8-0	20x24"	48"
120 Jupiter	Hazleton	1870	0-8-0	20x24"	48"

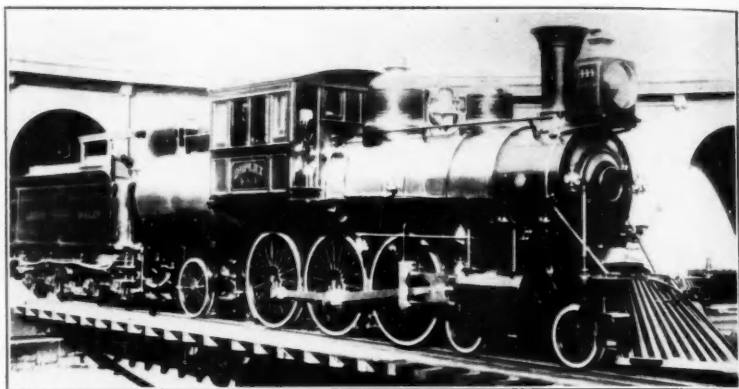
121 Eckley	Hazleton	1867	0-6-0	14x22"	44"
122 Highland	Baldwin	1871	4-6-0	16x22"	44"
122 Morris	Delano	1874	Sold P & N Y R R		
			4-6-0	18x24"	50½"
			Reb—W-Barre	5-1893	
123 Mahoning	Baldwin	# 1845 1869	4-6-0	18x22"	54"
			Reb—W-Barre	10-1886	
124 Kittatinny	Baldwin	1846 1869	4-6-0	18x22"	54"
			Sold P & N Y R R		
124 Union	Baldwin	3609 1874	4-6-0	18x24"	50½"
			Reb—W-Barre	8-1893	
125 Wysauking	Mason	314 1869	4-6-0	17x24"	48"
126 Wyalusing	Mason	317 1869	4-6-0	17x24"	48"
			Reb—S. Easton	10-1888	
127 Springville	Baldwin	1936 1869	4-6-0	18x22"	54"
			Reb—Delano	6-1881	
128 Susquehanna	Baldwin	1937 1869	4-6-0	18x22"	54"
			Sold—P & N Y R R		
128 Bergen	Baldwin	3622 1874	4-6-0	18x24"	50½"
129 North Branch	Baldwin	1939 1869	4-6-0	18x22"	54"
			Sold—P & N Y R R		
129 Mercer	Baldwin	3630 1874	4-6-0	18x24"	50½"
			Reb—S. Easton	8-1889	
130 Tunkhannock	Baldwin	1967 1869	4-6-0	18x22"	55"
			Reb—W-Barre	10-1885	
131 Meshoppen	Baldwin	1969 1869	4-6-0	18x22"	55"
			Reb—W-Barre	11-1887	
132 Mehoopany	Baldwin	1998 1869	4-6-0	18x22"	54"
			Reb—W-Barre	11-1885	
133 Waverly	Baldwin	2006 1869	4-6-0	18x22"	54"
			Reb—W-Barre	8-1886	
134 Chemung	Baldwin	2007 1869	4-6-0	18x22"	54"
			Reb—W-Barre	8-1885	
135 Buffalo	Baldwin	2008 1869	4-6-0	18x22"	54"
			Reb—W-Barre	3-1886	
136 Senator	Weatherly	1869	4-4-0	17x24"	60"
137 Weatherly	Weatherly	1870	4-4-0	17x24"	60"
			Sold—P & N Y R R		
137 Mammouth	Baldwin	1874	4-6-0	18x24"	50½"
			Reb—S. Easton	10-1888	
138 Coleraine	Weatherly	1870	4-4-0	17x24"	60"
			Reb—Weatherly	8-1884	
139 South Easton	S. Easton	1870	4-4-0	17x22"	60"
			Reb—S. Easton	5-1890	
140 Glendon	S. Easton	1870	4-4-0	17x22"	60"
			Reb—S. Easton	7-1885	
141 Vosburg	Baldwin	2053 1870	4-6-0	18x24"	54"
			Sold—P & N Y R R		
141 Burlington	Baldwin	1874	4-6-0	18x24"	50½"
142 Ulster	Baldwin	2055 1870	4-6-0	18x24"	54"
			Sold—P & N Y R R		
142 Cumberland	Baldwin	1874	4-6-0	18x24"	50½"
143 Milan	Baldwin	2056 1870	4-6-0	18x24"	54"
			Sold—P & N Y R R		
143 Salem	Hazleton	1876	0-6-0	16x22"	44"
144 Athens	Baldwin	2060 1870	4-6-0	18x24"	54"
			Reb—Delano	9-1880	
145 Bradford	Baldwin	2062 1870	4-6-0	18x24"	54"
			Reb—W-Barre	6-1886	
146 Luzerne	Baldwin	2065 1870	4-6-0	18x24"	54"
			Reb—Delano	2-1892	





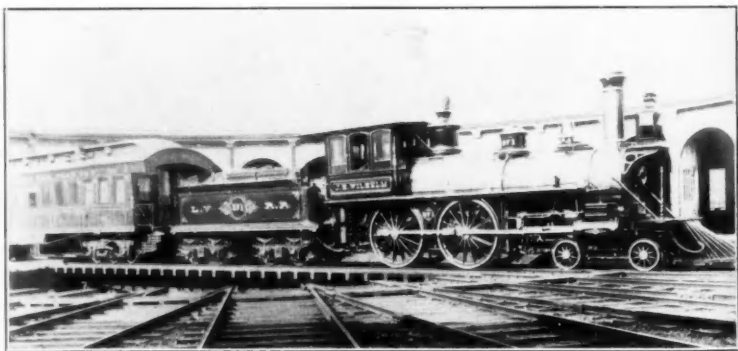
L. V. 300, "Dorothy," Built at Wilkes-Barre Shops, 5-1884. Sold to J. B. Vaughan, Kingston, Pa., 5-17-34. Picture Taken 1884.

Courtesy of Clinton T. Andrews.



Courtesy of Clinton T. Andrews.

L. V. 444, "Duplex," First 4-6-2 ever built, Wilkes-Barre Shops, 1886.



Courtesy of Clinton T. Andrews.

L. V. 371, "J. H. Wilhelm," built at So. Easton Shops 1888. This engine pulled the pay car for years. Taken at So. Easton 1888.

147 L. Chamberlain	Delano	1870	2-6-0	17x24"	61½"
148 Evangeline	Delano	1871	4-4-0	18x22"	62"
			Reb—Delano	2-1888	
149 Phillipsburg	Mason	# 351 1870	4-6-0	17x24"	48"
			Reb—Delano	1-1888	
150 Freemansburg	Mason	354 1870	4-6-0	17x24"	48"
			Reb—S. Easton	3-1891	
151 Hokendauqua	Mason	357 1870	4-6-0	17x24"	48"
			Reb—Delano	2-1888	
152 Coplay	Mason	358 1870	4-6-0	17x24"	48"
			Reb—Delano	2-1889	
153 Whitehall	Mason	359 1870	4-6-0	17x24"	48"
			Reb—Delano	2-1887	
154 Rockdale	Mason	360 1870	4-6-0	17x24"	48"
			Reb—S. Easton	1-1891	
155 Rockport	Mason	365 1870	4-6-0	17x24"	48"
			Reb—Delano	6-1888	
156 Bridgeport	Mason	369 1870	4-6-0	17x24"	48"
			Reb—S. Easton	4-1886	
157 Plainesville	Mason	373 1870	4-6-0	17x24"	48"
			Reb—S. Easton	12-1890	
158 Pittston	Mason	374 1870	4-6-0	17x24"	48"
159 Ario Pardee	Weatherly	1871	4-4-0	17x24"	60"
			Reb—W-Barre	9-1890	
160 J. G. Fell	Weatherly	1871	4-4-0	17x24"	60"
			Reb—Delano	8-1889	
161 Maine	Baldwin	2373 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
161 Middlesex	Hazleton	1876	4-6-0	16x22"	44"
162 New Hampshire	Baldwin	2378 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
162 Perth Amboy	Mason	533 1874	4-6-0	17x24"	48"
			Reb—S. Easton	11-1889	
163 Vermont	Baldwin	2379 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
163 Metuchen	Mason	534 1874	4-6-0	17x24"	48"
			Reb—S. Easton	9-1887	
164 Massachusetts	Baldwin	2380 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
164 Janus	Mason	438 1871	0-6-6-0	15x22"	44"
165 Rhode Island	Baldwin	2381 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
165 Maryland	Baldwin	2679 1872	2-8-0	20x24"	48"
			Reb—W-Barre	4-1882	
166 Connecticut	Baldwin	2386 1871	4-6-0	18x24"	54"
			Sold—P & N Y R R		
166 Virginia	Baldwin	2682 1872	2-8-0	20x24"	48"
			Reb—W-Barre	6-1883	
167 Ceres	Baldwin	2565 1871	4-6-0	18x24"	55¼"
			Sold—P & N Y R R		
167 Carolina	Baldwin	2699 1872	2-8-0	20x24"	48"
			Reb—W-Barre	4-1885	
168 Pallas	Baldwin	2561 1871	4-6-0	18x24"	55¼"
			Sold—P & N Y R R		
168 Georgia	Baldwin	2701 1872	2-8-0	20x24"	48"
			Reb—Delano	11-1890	
169 Juno	Baldwin	2567 1871	4-6-0	18x24"	55¼"
			Sold—P & N Y R R		
169 Florida	Baldwin	2733 1872	2-8-0	20x24"	48"
			Reb—Delano	3-1891	

170 Vesta	Baldwin	#2590	1871	4-6-0	18x24"	55 3/4"
170 Alabama	Baldwin	2742	1872	2-8-0	20x24"	48"
171 Mogul	Baldwin	2587	1871	2-8-0	20x24"	50 1/2"
172 Tycoon	Baldwin	2589	1871	2-8-0	20x24"	50 1/2"
173 Keystone	Weatherly		1872	4-8-0	20x26"	49"
174 Kentucky	Weatherly		1872	4-8-0	20x26"	49"
175 Crystal Ridge	Hazleton		1871	0-8-0	20x24"	48"
176 Laurel Hill	Hazleton		1872	0-8-0	20x24"	48"
177 Enterprise	Hazleton		1872	0-6-0	16x22"	44"
177 Flemington	Mason	535	1874	4-6-0	17x24"	48"
178 Tomhicken	Hazleton		1872	4-4-0	18x22"	62"
178 Woodbridge	Mason	538	1874	4-6-0	17x24"	48"
179 Conyngham	Hazleton		1872	0-6-0	16x22"	44"
180 Mt. Pleasant	Hazleton		1872	4-6-0	19x24"	55 1/2"
181 Woodside	Hazleton		1873	4-6-0	19x24"	55 1/2"
182 Milnesville	Hazleton		1873	0-6-0	16x22"	44"
183 Onoko	Weatherly		1873	4-8-0	20x26"	48"
184 Comet	Weatherly		1874	4-6-0	18x26"	48"
185 B. G. Markle	Hazleton		1873	4-4-0	18x22"	62"
186 Cranberry	Hazleton		1873	0-6-0	16x22"	44"
187 Oakdale	Hazleton		1873	4-6-0	19x24"	55 1/2"
188 Black Creek	Hazleton		1874	4-6-0	19x24"	55 1/2"
189 H. S. Goodwin	Weatherly		1873	4-6-0	18x26"	48"
190 Alps	Weatherly		1874	4-6-0	18x26"	48"
191 Lopatcong	Mason	504	1873	4-6-0	17x24"	48"
192 Pohatcong	Mason	505	1873	4-6-0	17x24"	48"
193 Musconetcong	Mason	507	1873	4-6-0	17x24"	48"
194 Raritan	Mason	513	1873	4-6-0	17x24"	48"
194 Neshanic	Mason	539	1874	4-6-0	17x24"	48"
195 Bound Brook	Mason	514	1873	4-6-0	17x24"	48"
196 Clinton	Mason	515	1873	4-6-0	17x24"	48"
197 New Market	Mason	540	1874	4-6-0	17x24"	48"
198 Bloomsbury	Mason	541	1874	4-6-0	17x24"	48"
199 Hamden	Mason	544	1874	4-6-0	17x24"	48"
200 Hollywood	Hazleton		1874	4-6-0	19x24"	55 1/2"
201 Hornet	Refer to #6					
201 J. P. Cox	Wilkes-Barre		1877	4-4-0	18x24"	62"

202 Little Lehigh	Refer to #24								
202 W. Stevenson	?								
203 C. F. Wells	Baldwin	#2336	1871	4-4-0	19x24"	69"	Reb—Sayre	6-1885	
					16x22"	62"			
204 V. E. Piollet	Baldwin	2337	1871	4-4-0	16x22"	62"	Reb—Sayre	8-1889	
							Reb—Sayre	10-1889	
205 Massachusetts	Refer to #164						Reb—Sayre	9-1890	
206 Rhode Island	Refer to #165						Reb—Sayre	4-1886	
207 Connecticut	Refer to #166						Reb—Sayre	8-1889	
208 Ceres	Refer to #167						Reb—Sayre	4-1889	
209 Pallas	Refer to #168						Reb—Sayre	12-1888	
210 Juno	Refer to #169						Reb—Sayre	7-1888	
211 Vesta	Refer to #170						Reb—Sayre	9-1888	
212 Elmira	Mason	473	1872	4-6-0	17x24"	48"			
							Reb—Sayre	6-1890	
213 Owego	Mason	474	1872	4-6-0	17x24"	48"	Reb—Sayre	11-1890	
							Reb—Sayre	48"	
214 Dushore	Mason	477	1872	4-6-0	17x24"	48"	Reb—Sayre	2-1890	
							Reb—Sayre	48"	
215 Bernice	Mason	478	1872	4-6-0	17x24"	48"	Reb—Sayre	11-1889	
							Reb—Sayre	48"	
216 Auburn	Mason	479	1872	4-6-0	17x24"	48"	Reb—Sayre	9-1889	
							Reb—Sayre	48"	
217 Niagara	Mason	480	1872	4-6-0	17x24"	48"	Reb—Sayre	4-1886	
							Reb—Sayre	44"	
218 Schraeder	Hazleton		1872	0-6-0	16x22"	44"			
218 G. M. Diven	Sayre		1885	4-4-0	18x24"	69"			
219 Wyoming	Baldwin	1062	1862	4-4-0	13x24"	60"	Reb—Weatherly	6-1875	
							Reb—W-Barre	10-1876	
220 Gazelle	Refer to #56								
221 Merger	Refer to #90								
222 Eagle	Refer to #93						Reb—Sayre	6-1885	
223 W. W. Longstreth	Refer to #94						Reb—Sayre	4-1884	
224 Highland	Refer to #122								
225 Kittatinny	Refer to #124						Reb—Sayre	4-1887	
226 Susquehanna	Refer to #128						Reb—Sayre	3-1886	
227 North Branch	Refer to #129						Reb—Sayre	6-1885	
228 Weatherly	Refer to #137								
229 Vosburg	Refer to #141						Reb—Sayre	7-1883	
230 Ulster	Refer to #142						Reb—Sayre	4-1884	
231 Milan	Refer to #143						Reb—W-Barre	7-1879	
232 Maine	Refer to #161						Reb—Sayre	8-1887	
233 New Hampshire	Refer to #162						Reb—Sayre	8-1887	
234 Vermont	Refer to #163						Reb—Sayre	6-1888	
235 Enterprise	Refer to #177								
236 Tomhicken	Refer to #178						Reb—Sayre	10-1886	
237 Raritan	Refer to #194						Reb—Sayre	4-1888	
238 Thos. Desmond	Baldwin	3631	1874	4-4-0	17x24"	60"			
239 Robt. Lockhart	Baldwin	3628	1874	4-4-0	17x24"	66"			
240 Drifton	Refer to #114								
241 Live Oak	Baldwin	3918	1876	4-6-0	18x24"	48"			
242 Hickory	Baldwin	3919	1876	4-6-0	18x24"	48"			
243 Walnut	Baldwin	3924	1876	4-6-0	18x24"	48"			
244 Chestnut	Baldwin	3925	1876	4-6-0	18x24"	48"			
245 Maple	Baldwin	3926	1876	4-6-0	18x24"	48"			
246 Cypress	Baldwin	3928	1876	4-6-0	18x24"	48"			
247 Tamarack	Baldwin	3927	1876	4-6-0	18x24"	48"			
248 Cedar	Baldwin	3929	1876	4-6-0	18x24"	48"			
249 Magnolia	Baldwin	3930	1876	4-6-0	18x24"	48"			
250 Palmetto	Baldwin	3931	1876	4-6-0	18x24"	48"			

251	R. A. Packer	Weatherly	1875	4-4-0	18x24"	48"	
252	A. W. Stegman	Wilkes-Barre	1878	4-4-0	18x24"	60"	
Nos. 253-264 carried no names							
265	Grover Cleveland	Baldwin	*6418	1882	4-4-0	19x24"	66"
266	Howard Ebner	Baldwin	6421	1882	4-4-0	19x24"	66"
267	Robt. Pattison	Baldwin	6542	1883	4-4-0	19x24"	66"
268	Richard Elmer	Baldwin	6543	1883	4-4-0	19x24"	66"
Nos. 269-274 carried no names							
275	Louisiana	Hazleton	1882	4-6-0	20x24"	54"	
Reb—Sayre 1-1891							
Nos. 276-299 carried no names							
300	Dorothy	Wilkes-Barre	1884	4-2-4	11x20"	56"	
301	Cricket	Hazleton	1870	?-2-?	8x9½"	48"	
302	Sugar Loaf	Hazleton	1875	4-6-0	19x24"	55½"	
Reb—Hazleton 3-1888							
303	Chas. Hartshorne	Weatherly	1875	4-4-0	18x24"	66"	
304	Robt. A. Packer	Weatherly	1875	4-4-0	18x24"	66"	
305	David Thomas	Weatherly	1875	4-4-0	17x24"	60"	
Reb—S. Easton 10-1890							
306	Ashbel Welch	Weatherly	1875	4-4-0	17x24"	60"	
307	Wm. H. Gatzman	S. Easton	1875	4-4-0	17x24"	60"	
Reb—S. Easton 10-1890							
308	America	S. Easton	1876	4-4-0	17x24"	66½"	
Reb—S. Easton 8-1890							
309	Charles B. Cummings	S. Easton	1886	4-4-0	19x24"	69"	
310	United States	Baldwin	3862	1876	2-8-0	20x24"	49½"
Reb—W-Barre 1-1892							
311	Tennessee	Baldwin	3795	1875	4-6-0	18x24"	54"
Reb—S. Easton 8-1890							
312	Ohio	Baldwin	3796	1875	4-6-0	18x24"	54"
Reb—S. Easton 12-1886							
313	Indiana	Baldwin	3797	1875	4-6-0	18x24"	54"
Reb—S. Easton 9-1887							
314	Illinois	Baldwin	3798	1875	4-6-0	18x24"	54"
Reb—S. Easton 11-1892							
315	Michigan	Baldwin	3799	1875	4-6-0	18x24"	54"
Reb—S. Easton 2-1888							
316	Wisconsin	Baldwin	3800	1875	4-6-0	18x24"	54"
Reb—S. Easton 12-1889							
317	Minnesota	Baldwin	3802	1875	4-6-0	18x24"	54"
Reb—S. Easton 1-1889							
318	Iowa	Baldwin	3803	1875	4-6-0	18x24"	54"
Reb—S. Easton 6-1891							
319	Missouri	Baldwin	3805	1875	4-6-0	18x24"	54"
Reb—S. Easton 1-1889							
320	Arkansas	Baldwin	3813	1875	4-6-0	18x24"	54"
Reb—S. Easton 4-1892							
321	Leviston	Weatherly	1876	4-6-0	18x26"	48"	
322	Janesville	Weatherly	1876	4-6-0	18x26"	48"	
323	Empire	L. V. R. R. (?)	1876	4-6-0	18x24"	52"	
Reb—Sayre 11-1888							
324	Bedford	Grant	1876	2-8-0	20x24"	50½"	
Reb—W-Barre 8-1892							
325	Fayette	Grant	1876	2-8-0	20x24"	50½"	
326	Franklin	Grant	1876	2-8-0	20x24"	50½"	
327	Clarion	Grant	1876	2-8-0	20x24"	50½"	
Reb—W-Barre 6-1891							
328	Chester	Grant	1876	2-8-0	20x24"	50½"	
Reb—W-Barre 10-1888							
329	Montour	Grant	1876	2-8-0	20x24"	50½"	
Reb—W-Barre 8-1887							

330 Cambria	Grant	1876	2-8-0	20x24"	50½"
			Reb—W-Barre	5-1889	
331 Dauphin	Grant	1876	2-8-0	20x24"	50½"
			Reb—W-Barre	11-1888	
332 Mifflin	Grant	1876	2-8-0	20x24"	50½"
			Reb—W-Barre	3-1892	
333 Monroe	Grant	1876	2-8-0	20x24"	50½"
			Reb—W-Barre	11-1889	
334 Wm. B. Mack	Weatherly	1877	4-4-0	18x24"	60"
335 James I. Blakslee	Weatherly	1877	4-4-0	18x24"	60"
336 Nonpareil	Weatherly	1878	4-8-0	20x26"	48"
337 Yorktown	Weatherly	1879	4-8-0	20x26"	48"
			Reb—Weatherly	9-1892	
338 E. P. Wilbur	Weatherly	1879	4-8-0	20x26"	48"
339 Huron	Weatherly	1879	0-6-0	16x22"	44"
340 Independence	Delano	1879	2-8-0	20x24"	50"
			Reb—Delano	12-1889	
341 A. Mitchell	Delano	1880	4-4-0	19x24"	62"
			Reb—Delano	6-1890	
342 Ashland	Delano	1880	2-8-0	20x24"	49"
			Reb—Delano	5-1890	
343 Girardville	Delano	1880	2-8-0	20x24"	49"
			Reb—Delano	9-1891	
344 Amazon	Weatherly	1880	4-8-0	20x26"	48"
345 Monitor	Hazleton	1880	4-6-0	20x24"	55¼"
			Reb—W-Barre	8-1892	
346 Mohawk	Hazleton	1880	4-6-0	20x24"	55¼"
			Reb—W-Barre	3-1885	
347 Brownsville	Baldwin	# 5168	1880	2-8-0	20x24"
348 Continental	Baldwin	5182	1880	2-8-0	20x24"
349 Fairview	Baldwin	5186	1880	2-8-0	20x24"
350 Packerton	Baldwin	5204	1880	2-8-0	20x24"
351 Titan	Baldwin	5183	1880	2-8-0	20x24"
			Reb—W-Barre	7-1890	
352 Cyclops	Baldwin	5167	1880	2-8-0	20x24"
353 Kansas	Baldwin	5255	1880	2-8-0	20x24"
			Reb—S. Easton	6-1892	
354 Nebraska	Baldwin	5209	1880	4-6-0	19x24"
			Reb—S. Easton	7-1894	
355 Colorado	Baldwin	5215	1880	4-6-0	19x24"
			Reb—S. Easton	7-1894	
356 Arizona	Baldwin	5221	1880	4-6-0	19x24"
			Reb—S. Easton	3-1895	
357 J. R. Fanshawe	?	?	4-4-0	20x24"	69"
			Reb—Hazleton	5-1890	
358 Cayuga	Hazleton	1880	4-6-0	20x24"	55¼"
			Reb—Hazleton	5-1889	
359 A. G. Broadhead Jr.	Delano	1880	4-4-0	19x24"	62"
			Reb—Delano	11-1891	
360 H. E. Packer	Delano	1880	4-4-0	19x24"	62"
361 Fred Mercur	?	?	4-4-0	20x24"	63"
			Reb—Hazleton	8-1891	
362 Black Ridge	?	?	4-6-0	20x24"	56"
			Reb—Sayre	8-1890	
363 Hazle Creek	Delano	1885	2-8-0	20x26"	50"
			Reb—S. Easton	9-1891	
364 Logan	Delano	1882	2-8-0	20x26"	50"
365 Hazle Dell	Delano	1882	2-8-0	20x26"	50"
366 Hudsondale	Delano	1881	2-8-0	20x26"	50"
367 Yatesville	Delano	1881	2-8-0	20x26"	50"
368 Rambler	Weatherly	1881	4-8-0	20x26"	50"

369 Rambler	?	?	4-8-0	20x26"	50"	
			Reb—S.	Easton	4-1891	
370 Wm. H. Rathbun	S. Easton	1887	4-4-0	19x24"	62"	
371 J. H. Wilhelm	S. Easton	1888	4-4-0	19x24"	62"	
372 W. A. Ingham	S. Easton	1888	4-4-0	19x24"	62"	
373 Joseph Patterson	S. Easton	1890	4-4-0	19x24"	62"	
374 Hopkin Thomas	Weatherly	1881	4-8-0	20x26"	50"	
375 E. M. Patterson	Weatherly	1881	4-8-0	20x26"	50"	
376 Excelsior	Weatherly	1882	4-8-0	20x26"	50"	
377 Ottawa	?	?	4-8-0	20x26"	50"	
			Reb—S.	Easton	2-1891	
378 Pawnee	Weatherly	1882	4-8-0	20x26"	50"	
379 Cheyenne	?	?	4-8-0	20x26"	50"	
			Reb—S.	Easton	7-1891	
380 Chickasaw	?	?	4-8-0	20x26"	50"	
			Reb—S.	Easton	9-1891	
381 Saturn	?	?	2-8-0	20x24"	48"	
			Reb—W-Barre	4-1890		
382 Wm. Conyngham	W-Barre	1882	4-4-0	19x24"	66"	
383 Elisha Hancock	W-Barre	1884	4-4-0	19x24"	66"	
384 Hiawatha	Delano	1883	4-4-0	19x24"	62½"	
385 I. W. Morris	Delano	1883	4-4-0	19x24"	62½"	
386 Alonzo P. Blakslee	Delano	1883	4-4-0	20x24"	69"	
387 John Taylor	Delano	1882	4-4-0	19x24"	63"	
388 Wm. C. Norris	Delano	1888	4-4-0	19x24"	62"	
389 Primrose	Delano	1882	2-8-0	20x26"	49"	
390 Raven Run	Delano	1882	2-8-0	20x26"	49"	
391 Freeland	Hazleton	1882	0-6-0	16x22"	44"	
392 Black Diamond	Hazleton	1882	4-6-0	20x24"	54"	
393 Delaware	?	?	4-6-0	19x24"	55½"	
			Reb—S.	Easton	3-1892	
394 Wyoming	Hazleton	1882	4-6-0	20x24"	54"	
395 California	?	?	4-6-0	19x24"	56"	
			Reb—S.	Easton	5-1892	
396 Louisiana	Hazleton	1883	4-6-0	20x24"	54"	
397 Mississippi	Hazleton	1882	4-6-0	20x24"	54"	
398 Buck Mountain	Hazleton	1882	4-6-0	19x24"	62"	
			Reb—S.	Easton	4-1890	
399 Oregon	Hazleton	1885	4-6-0	20x24"	54"	
400 W. C. Anderson	?	?	4-4-0	20x24"	62"	
			Reb—Hazleton	3-1894		
401 Anchor	Delano	1883	4-6-0	20x24"	50¼"	
402 Progress	Delano	1883	4-6-0	20x24"	49¼"	
403 Belmore	Delano	1883	2-8-0	20x24"	49¼"	
404 Eureka	Delano	1883	4-6-0	20x24"	54"	
405 Kohinoor	Delano	1885	4-6-0	20x24"	54"	
406 L. Chamberlain	Delano	1887	4-4-0	20x24"	49½"	
407 John R. Fell	Delano	1887	4-4-0	20x24"	62½"	
408 Park Place	Delano	1887	4-6-0	20x24"	55"	
409 Lofty	Delano	1888	4-6-0	20x24"	55"	
410 Highland	Delano	1888	4-6-0	20x24"	55"	
411 Powhattan	Weatherly	1883	4-8-0	20x26"	48"	
			Reb—S.	Easton	8-1891	
412 Pocahontas	Weatherly	1883	4-8-0	20x26"	48"	
			Reb—S.	Easton	6-1891	
413 Mohican	Weatherly	1883	4-8-0	20x26"	48"	
414 Massasoit	Weatherly	1883	4-8-0	20x26"	48"	
			Reb—S.	Easton	5-1891	
415 Wyandot	Weatherly	1883	4-8-0	20x26"	48"	
416 Idlewood	Weatherly	1883	4-4-0	20x24"	67½"	
417 G. B. Linderman	Weatherly	1884	4-4-0	20x24"	67½"	



418 Pike	Hazleton	1883	0-6-0T	14x18"	33"	
419 Perry	Hazleton	1883	0-6-0T	14x18"	33"	
420 Pontiac	Hazleton	1883	0-6-0	17x22"	44½"	
421 H. S. Goodwin	S. Easton	1884	4-4-0	19x24"	68"	
			Reb—S.	Easton	1-1893	
422 John B. Garrett	S. Easton	1886	4-4-0	19x24"	68"	
423 Charles O. Sheer	S. Easton	1886	4-4-0	19x24"	68"	
			Reb—S.	Easton	9-1896	
424 James Donnelly	S. Easton	1886	4-4-0	19x24"	68"	
			Reb—S.	Easton	2-1894	
425 Rollin H. Wilbur	S. Easton	1887	4-4-0	19x24"	68"	
426 Osceola	Weatherly	1884	4-8-0	20x26"	48"	
427 Tecumseh	Weatherly	1884	4-8-0	20x26"	48"	
428	Weatherly	1885	4-8-0	20x26"	48"	
429 Soudan	Weatherly	1886	4-8-0	20x26"	48"	
430 Vesuvius	Weatherly	1887	4-8-0	20x26"	48"	
431 Pocano	Hazleton	1883	4-6-0	20x24"	55½"	
			Reb—W-Barre	7-1890		
432 Jackson	Hazleton	1883	0-6-0	17x22"	44½"	
			Reb—W-Barre	6-1896		
433 Jasper	Hazleton	1884	0-6-0	17x22"	44½"	
434 Sullivan	Hazleton	1884	0-6-0	17x22"	44½"	
435 Wayne	Hazleton	1884	0-6-0	17x22"	44½"	
436 Potter	Hazleton	1884	0-6-0T	14x18"	33"	
437 Wm. H. Sayre	Hazleton	1887	4-4-0	20x22"	62½"	
438 Tomhicken	Hazleton	1887	4-6-0	20x24"	55½"	
439 New Boston	Hazleton	1887	4-6-0	20x24"	55½"	
440 William Brockie	Hazleton	1888	4-4-0	20x24"	68"	
441 Sandy Run	Hazleton	1888	4-6-0	20x26"	56¾"	
442 Drifton	Hazleton	1888	4-6-0	20x26"	56¾"	
443 W. A. Lathrop	Delano	1889	4-4-0	20x24"	63"	
444 Duplex	W-Barre	1886	4-6-2	20x24"	62"	
445 Little Lehigh	S. Easton	1887	0-6-0	18x22"	44½"	
446 Jordan	S. Easton	1888	0-6-0	18x22"	44½"	
Nos. 447-450 carried no names						
451 Enterprise	Baldwin	#9056	1888	2-8-0	20x24"	50"
452 Mill Creek	Baldwin	9057	1888	2-8-0	20x24"	50"
453 Warrior Run	Baldwin	9060	1888	2-8-0	20x24"	50"
454 Espy Run	Baldwin	9061	1888	2-8-0	20x24"	50"
455 Slocum	Baldwin	9062	1888	2-8-0	20x24"	50"
456 Penobscot	Baldwin	9669	1888	2-8-0	20x24"	50"
457 Glen Summit	Baldwin	9670	1888	2-8-0	20x24"	50"
458 Bear Creek	Baldwin	9673	1888	2-8-0	20x24"	50"
459 Beaupland	Baldwin	9676	1888	2-8-0	20x24"	50"
460 Moosehead	Baldwin	9675	1888	2-8-0	20x24"	50"
461 President	Weatherly	1887	4-8-0	20x24"	50"	
462 Duluth	Weatherly	1888	4-8-0	20x24"	50"	
463 S. Drinker	Weatherly	1888	4-4-0	20x24"	67"	
Nos. 464-465 carried no names						
466 Maine	Baldwin	8944	1888	4-6-0	20x24"	54"
467 New Hampshire	Baldwin	8945	1888	4-6-0	20x24"	54"
468 Vermont	Baldwin	8946	1888	4-6-0	20x24"	54"
469 Massachusetts	Baldwin	8949	1888	4-6-0	20x24"	54"
470 Rhode Island	Baldwin	8952	1888	4-6-0	20x24"	54"
471 Audenried	Hazleton	1888	4-4-0	20x24"	68"	
471 John Campbell	Hazleton	1888	4-4-0	20x24"	68"	
472 Caliban	Hazleton	1889	0-6-0	14x18"	33"	
473 Oberon	Hazleton	1889	0-6-0	14x18"	33"	
474 Prospero	Hazleton	1889	0-6-0	14x18"	33"	
Nos. 475-485 carried no names						
486 Calvin Pardee	S. Easton	1889	4-4-0	19x24"	69"	

Nos. 487-503 carried no names					
504	Wm. H. Bissell	S. Easton	1889	4-4-0	19x24" 69"
505	Not named				
506	Wm. P. Henry	S. Easton	1889	4-4-0	19x24" 69"
Nos. 507-518 carried no names					
519	J. M. Weaver	Baldwin	1889	4-4-0	18x24" 69"
520	J. I. Kinsey	Baldwin	1889	4-4-0	18x24" 69"
521	P. C. Doyle	Hazleton	1889	4-4-0	20x24" 68"
522	E. B. Byington	Hazleton	1889	4-4-0	20x24" 68"
Nos. 523-525 carried no names					
526	Col. J. M. Horton	Baldwin (?)	?	4-4-0	17x24" 66"
					Reb—Sayre 11-1889
Nos. 527-536 carried no names					
537	J. S. Lentz	Hazleton	1889	4-4-0	20x22" 62½"
538	Richard Caffrey	Delano	1890	4-4-0	20x22" 62½"
Nos. 539-540 carried no names					
541	Henry Green	Weatherly	1890	4-4-0	20x24" 69"
Nos. 542-551 carried no names					
552	E. P. Wilbur	Weatherly	1890	4-4-0	20x24" 69"
Nos. 553-609 carried no names					
610	Charles Dorrance	Baldwin	#12388	1892	2-4-4 15x22" 56"
611	J. W. Hollenback	Baldwin	12389	1892	2-4-4 15x22" 56"
Nos. 612-657 carried no names					
658	Harry E. Packer	Hazleton	1894	4-4-0	20x24" 69"

L. V. #471 was originally named "Audenried" and subsequently renamed "John Campbell" because David Clark of the Hazleton Shops renamed the "Delano" #66, the "David Clark."

L. V. #357—"John B. Fanshawe" was the first engine with the Wootten type firebox on the road.

Instead of crediting engines built by the Lehigh Valley to the road, the individual shop has been noted. The Lehigh Valley R. R. built engines in six of its shops: Delano, Hazleton, Sayre, South Easton, Weatherly and Wilkes-Barre.

Our members must understand that the Pennsylvania & New York Canal & Railroad Co. was controlled by the Lehigh Valley. Many of the Lehigh Valley engines were transferred by sale to the "P & N Y R R" and when the latter road became an integral part of the Lehigh Valley these locomotives were transferred to the parent company and assigned a new number in the L. V. roster. For the sake of brevity a full description of these engines as they returned to the Lehigh Valley is not included but this will be found under their original numbering.

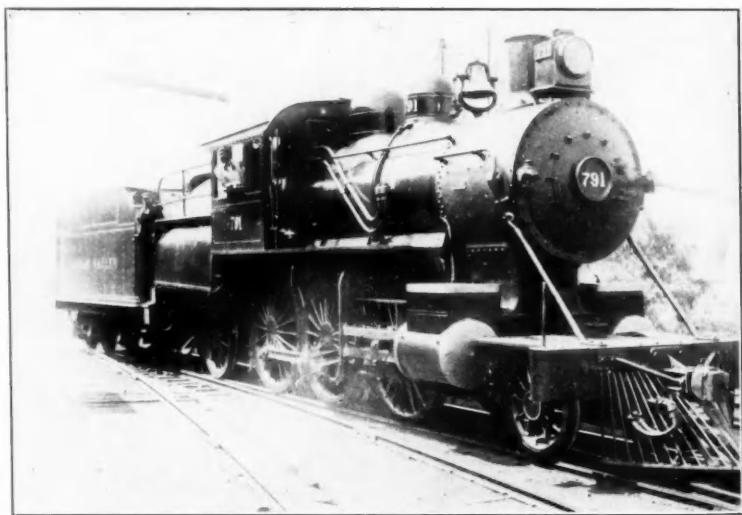


L. V. "Black Diamond" Express, 1897. Taken at Pittston, Pa.

Courtesy of Clinton T. Andrews.



L. V. 232, Class N-1, Baldwin, 1903. Courtesy of K. E. Schlachter.



L. V. 791, Baldwin, 1902. Courtesy of Clinton T. Andrews.

Year	Total Earnings	Earnings From Coal	Total Expenses	Net Earnings	No. of Tons of Coal Carried
1857	\$ 441,187.46	\$ 337,074.62	\$ 172,462.59	\$ 268,724.87	418,235
1858	442,045.35	338,800.05	194,673.76	247,371.59	471,029
1859	525,866.48	391,766.81	211,972.50	313,893.98	577,651
1860	679,908.59	514,530.40	337,869.05	342,039.54	730,642
1861	679,491.30	499,877.92	321,337.65	358,153.65	743,672
1862	856,054.53	630,624.90	407,552.82	448,501.71	882,574
1863	1,370,075.80	1,075,545.65	589,099.44	780,976.36	1,195,155
1864	2,396,409.33	1,898,118.35	1,005,135.54	1,391,273.79	1,295,419
1865	3,238,337.06	2,513,701.08	1,618,156.81	1,620,180.25	1,402,277
1866	3,711,574.73	2,780,262.75	1,748,569.50	1,963,005.23	1,731,722
1867	3,641,136.08	2,535,689.27	2,147,208.88	1,493,927.20	1,965,541
1868	4,270,649.70	3,108,296.49	2,501,293.69	1,769,356.01	2,284,461
1869	4,925,061.06	3,564,822.21	2,821,050.37	2,104,010.69	2,087,852
1870	5,938,167.48	4,497,296.93	3,617,407.38	2,320,760.10	3,162,705
1871	5,290,724.65	3,687,466.83	3,462,029.78	1,828,694.87	2,598,215
1872	5,982,949.48	4,250,729.58	3,869,686.98	2,113,262.50	3,877,719
1873	6,710,564.57	4,860,906.68	3,884,859.97	2,825,704.60	4,172,366
1874	6,759,391.02	4,958,209.57	3,471,418.41	3,287,972.61	4,177,282
1875	6,046,495.44	4,425,009.86	3,262,861.97	2,783,633.47	3,333,472
1876	7,049,646.56	5,030,241.60	3,842,750.04	3,206,896.52	3,987,018
1877	6,488,036.62	4,731,725.75	3,162,822.06	3,325,214.56	4,391,286
1878	5,532,738.11	3,807,805.28	2,456,926.63	3,075,811.48	3,479,593
1879	5,932,325.65	4,011,444.50	2,996,981.28	2,935,344.37	4,415,284
1880	7,762,990.90	5,352,604.46	4,002,357.60	3,760,630.30	4,672,724
1881	9,423,857.76	6,678,590.27	4,648,083.78	4,775,773.98	5,870,701
1882	10,160,069.81	7,158,744.07	5,833,677.34	4,326,392.47	6,336,141
1883	10,218,149.86	7,401,795.94	6,175,656.16	4,042,493.70	6,592,646
1884	8,948,207.15	6,295,282.32	5,246,072.79	3,702,134.36	6,068,967
1885	8,556,917.03	6,079,541.75	4,888,997.83	3,667,919.20	6,312,430
1886	8,744,756.48	5,669,235.94	5,293,816.56	3,450,939.92	6,701,736
1887	9,719,056.07	6,165,411.29	6,142,396.25	3,576,659.82	6,883,957
1888	†	7,128,234.73	*	5,225,504.56	8,025,334
1889	16,674,964.58	8,647,464.73	11,419,383.71	5,255,580.87	8,607,038
1890	17,432,007.16	8,093,860.63	11,951,771.26	5,480,235.90	8,487,578
1891	18,910,260.71	8,679,883.70	13,075,909.55	5,834,351.16	10,597,801
1892					10,872,899
1893	12,106,612.25	6,118,450.10	8,599,427.34	3,507,184.91	11,823,460
1894	17,330,593.77	8,391,541.81	13,320,829.25	4,176,311.55	11,430,664
1895	18,564,454.16	8,470,859.32	14,028,452.86	4,658,677.86	12,501,562
1896	19,514,660.17	8,623,573.81	14,583,657.79	5,124,682.18	12,354,892

The figures for the year 1893 are for eight months only after the Lehigh Valley had been separated from the Philadelphia & Reading R. R.

†These figures now include those for the Pennsylvania & New York Canal and R. R. Co. as well as income from investments and other sources.

\*These figures now include those for the Pennsylvania & New York Canal and R. R. Co. as well as rentals of leased lines.

## EARLY OFFICERS OF THE LEHIGH VALLEY RAILROAD CO.

### *President*

J. GILLINGHAM FELL  
May 13, 1856 to Jan. 13, 1862

ASA PACKER  
Jan. 13, 1862 to July 25, 1864  
also  
Mar. 10, 1868 to May 17, 1879

WM. W. LONGSTRETH  
July 25, 1864 to Mar. 10, 1868

CHARLES HARTSHORNE  
Jan. 20, 1880 to Jan. 13, 1883

HARRY E. PACKER  
Jan. 13, 1883 to Feb. 1, 1884

ELISHA E. WILBUR  
Feb. 12, 1884 to July 13, 1897

### *Vice President*

ASA PACKER  
Aug. 2, 1864 to Mar. 10, 1868

CHARLES HARTSHORNE  
Mar. 10, 1868 to Jan. 20, 1880  
also  
Jan. 13, 1883 to Jan. 1, 1899

### *Treasurer*

WM. N. ELY  
Jan. 13, 1862 to Aug. 2, 1864

L. CHAMBERLAIN  
Aug. 2, 1864 to June 1, 1868

CHARLES C. LONGSTRETH  
June 1, 1868 to Apr. 28, 1870

LLOYD CHAMBERLAIN  
May 10, 1870 to July 7, 1883

WM. G. ANDERSON  
July 10, 1883 to Jan. 18, 1898

J. A. HARRIS, JR.  
Jan. 18, 1898 to Sept. 20, 1899

### *Secretary*

WM. N. ELY  
Jan. 13, 1862 to Oct. 18, 1864

L. CHAMBERLAIN  
Oct. 18, 1864 to May 10, 1870

JOHN R. FANSHAW  
May 10, 1870 to Feb. 18, 1903

## MOTIVE POWER DEVELOPMENT ON THE LEHIGH VALLEY R. R. COVERING A PERIOD OF ONE HUNDRED YEARS

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(A Talk given before the New York Chapter of the Railway & Locomotive Historical Society, November 13, 1936.)

Mr. Chairman, Members and Guests:

I wish to express to the officers of the organization my appreciation for the invitation to speak here this evening.

We have obtained photographs of practically all the various types of locomotives used on our railroad since its earliest conception, about one hundred years ago. From these photographs, slides have been made, which I believe will convey a very good idea of the development of locomotives on the Lehigh Valley R. R. The pictures portray almost a complete history of the evolution of the steam locomotive since they cover a period back to the year 1837. This was only eight years after the first locomotive, the "Tom Thumb", which was built by Peter Cooper for the Baltimore & Ohio R. R. in 1829.

The Lehigh Valley Railroad Company operates a system comprising 1291 miles of road, located in the States of Pennsylvania, New York and New Jersey. We have, however, a total trackage of 3204 miles.

The main line, running from Jersey City, N. J. to Buffalo, N. Y., taps the anthracite region in which district is located a network of branch lines. We have many other branch lines, the most notable ones being those in the central part of New York State.

The eastern terminals at Jersey City and Perth Amboy provide immediate access to New York Harbor where we have most complete facilities for handling ocean shipments. At Buffalo, on Lake Erie and at North Fair Haven on Lake Ontario, we also have important dock and terminal facilities.

Here in New York City, the Lehigh Valley passenger trains arrive at and depart from the Pennsylvania Station, while in Buffalo we have one of the most modern passenger stations in the country. Through passenger service is also operated out of Philadelphia, using the Reading Railroad as far as Bethlehem, Pa., and by arrangement with the Grand Trunk Western-Canadian National Railways and the Michigan Central R. R., through passenger service is afforded between Chicago, Toronto and New York and Philadelphia over these two routes.

Regarding locomotives used on the Lehigh Valley R. R., the following record may be of interest:

In 1856—80 years ago, we had only .....	6 locomotives
In 1857—the following year .....	15 "
In 1860 .....	20 "
In 1865 .....	53 "
In 1875 .....	199 "
In 1880 .....	255 "
In 1890 .....	538 "
In 1896 .....	750 "
In 1903 .....	808 "
In 1921—the largest number .....	1020 "

At present we have 524 locomotives, of these

- 427 are superheated
- 479 have outside valve gears
- 300 have automatic train control
- 420 have power reverse gears
- 459 are equipped with brick arches
- 217 have segment type grates
- 30 are equipped with feed water heaters
- 108 have boosters
- 78 have automatic flue blowers
- 371 have force feed lubricators
- 52 have thermic syphons, and
- 340 have automatic stokers

The 1020 locomotives owned in the year 1921 consisted of 90 different classes with an aggregate tractive effort of 38,373,834 lbs., averaging 37,621 pounds per locomotive. Today we have only 36 classes as compared with the 90 classes of 1921. The present 524 locomotives have a total tractive effort of 26,982,409 lbs., averaging 51,493 lbs. per locomotive. These figures denote the trend in the 15 year period between 1921 and 1936. At the end of this period, while there was a decrease of nearly 49% in the number of locomotives, the average tractive power per locomotive increased nearly 37%.

In the year 1905, the American or 4-4-0 type, the 10-wheel or 4-6-0 type and the Consolidation or 2-8-0 type predominated. The American type gradually declined and became extinct in 1929 as did the Atlantic or 4-4-2 type, and the Mogul 2-6-0 type. The Prairie or 2-6-2 type became obsolete in 1913 and the Mastodon or 4-8-0 type was discarded in 1917.

It is not my intention to consume much time preliminary to the showing of the pictures; however, I would like to review very briefly, some of the early history of our railroad, for aside from the interest in the scientific development of the locomotive, the early history of this, as well as other railroads, holds a peculiar interest—something comparable to the interest prompted by tales told of the "Covered Wagon" or of the "Pony Express."

The oldest part of our railroad is that section between Mauch Chunk and Penn Haven, Pa. This was originally a part of the Beaver Meadow R. R., whose charter was granted April 7, 1830, the year in which the first steam locomotive ever built was put into operation. The first pictures to be shown are of engines used on this railroad and later became the property of the Lehigh Valley R. R. when it acquired the Beaver Meadow R. R. on July 8, 1864.

The inception of the Lehigh Valley R. R. proper and its development during the early years of its history can be accredited to the far-sightedness of Judge Asa Packer of Mauch Chunk, Pa. Having interested a group of other enterprising citizens, a charter was obtained from the Pennsylvania Legislature on September 20th, 1847 to form a company to be known as the Delaware, Lehigh, Schuylkill & Susquehanna R. R., of which Mr. James M. Potter was made President.

During the fall and winter of 1847, a survey was made between Lehighton and Easton, Pa., by R. B. Mason, Civil Engineer. However,



construction of the project was not started until the year 1851. On May 11th, 1852, Mr. Robert H. Sayre was appointed Chief Engineer and was destined to play an important part in the development of the railroad for many years to come.

On January 7th, 1853, or about two years before the railroad started operations, the name was changed to the Lehigh Valley Railroad Company and in the year 1855 the road was completed and put into operation between Mauch Chunk, Pa. and Phillipsburg, N. J. In the year 1864, the Lehigh Valley R. R. acquired both the Beaver Meadow and the Penn Haven & White Haven Railroads, thereby extending its lines westward to White Haven, Pa.

In 1865, work was begun on the road from White Haven to Wilkes-Barre, Pa. The completion of this work two years later added another important link. During this period the Lehigh Valley adopted the use of steel rails for use on the new construction and replacement purposes, as it was found they were much superior to the iron rails in use.

In 1866, the Lehigh Valley R. R. acquired the Lehigh & Mahanoy R. R., running from Black Creek Jet. to Mt. Carmel, Pa., penetrating a distance of 45 miles into the anthracite region.

In 1869, by acquiring a controlling interest in the Pennsylvania & New York Canal & Railroad Co., whose charter granted the authority to build a railroad along its canal, the Lehigh Valley laid its tracks from Wilkes-Barre, Pa. to Waverly, N. Y. At the latter point, connections were made with the Erie Railroad, six foot gauge, and a third rail was put down so that standard equipment of the Lehigh Valley could be operated over its lines.

In 1872, the Lehigh Valley R. R. purchased the stock of the Easton & Amboy R. R. and construction was started on what is now our New Jersey Division. This work was completed in 1876.

In the same year, through acquisition of the Geneva, Ithaca & Athens R. R., the Lehigh Valley was extended to Geneva, N. Y. This part of the railroad constitutes what we now term the "old line", running from Geneva to Van Etten Jet., N. Y., via Ithaca, a new line having subsequently been built along Seneca Lake.

On May 17, 1879, the Lehigh Valley R. R. suffered a great loss in the death of Judge Asa Packer who, more than any one man, had been responsible for the growth and development of the railroad up to that time.

On November 1, 1882, the Lehigh Valley R. R. inaugurated through passenger service between New York City and Buffalo, running over its own lines from New York City to Waverly, N. Y. and thence over the Erie R. R. to Buffalo, the latter company having completed the laying of the third rail on this part of the line in 1876.

During the years 1887 and 1888, the Mountain Cut-off was built that shortened the route for through freight service by eight miles and also reduced the grade. This cut-off extends from Pittston Jet. to Mountain Top, avoiding Wilkes-Barre. During these same years, work was progressing on the line from Geneva to Buffalo, N. Y. and this was finished in 1892. Thus completed the Lehigh Valley R. R. as we know it today.

This concludes a brief history of the Lehigh Valley R. R. which I elected to give partly in order that a clearer understanding might be had as you view the pictures, particularly as to the names appearing on the locomotives. You will understand that the Lehigh Valley Railroad System, like many other railroads, was formed partly by the acquisition of several small roads that formed connecting links in the parent road.

(Mr. Bertram's talk was followed by slides illustrating the different types of locomotives on the Lehigh Valley R. R. For obvious reasons we cannot reproduce the illustrations in our publication but his comments are so valuable that they deserve a place in our records.)

The "*Hercules*", built for the Beaver Meadow R. R. by Garrett & Eastwick of Philadelphia in 1837. This engine weighed 15 tons and was the first locomotive to utilize equalizing beams, commonly called now—equalizers. In April of the same year the Beaver Meadow R. R. built the "*Quakake*" and in August, the "*Beaver*". The shops of the Beaver Meadow R. R. were at that time located at Beaver Meadow, Pa. and were under the supervision of Hopkins Thomas, Master Mechanic, a Welsh immigrant. Mr. Thomas distinguished himself as an inventor. He made possible the use of anthracite coal for locomotive fuel and he invented and used successfully the chilled cast iron wheel. In the years 1837-38, he built in the Beaver Meadow Shops, the "*Nonpareil*", the first six-wheeled connected engine in the country. In 1839, the shops of the Beaver Meadow R. R. were moved to Weatherly, Pa., where many locomotives were built. During the years 1855-56, the Baldwin Locomotive Works built for the Beaver Meadow R. R. a group of five flexible beam truck locomotives of the 0-8-0 type with 16x20" cylinders. These were the "*Serida*", "*Orinoco*", "*Packerton*", "*Colorado*" and "*Paraguay*". Following these engines the Baldwin Company built several 10-wheelers with 18x24" cylinders.

The "*Delaware*", a wood burner of the 4-4-0 type with 13x24" cylinders, 60" drivers, wt. 46500 lbs., built by Richard Norris & Sons, December, 1855. Our records would indicate this to be the first locomotive built for the Lehigh Valley R. R. proper.

The "*Towanda*", built in May, 1866 by McKay & Aldus, East Boston, Mass., 4-6-0 type, 18x22" cylinders, 54" drivers. In the same year, this company also built the "*Tioga*", same design as the "*Towanda*." McKay & Aldus built two more engines, the "*Sampson*" and "*Hercules*", both of the 0-6-0 type with 16x22" cylinders, 48" drivers. The "*Hercules*" was the second engine to carry this name, being built 29 years after its predecessor.

The "*Consolidation*", built by the Baldwin Locomotive Works, July 1866, 20x24" cylinders, 48" drivers and weight of 85720 lbs. This engine was built according to specifications prepared by Alexander Mitchell, Master Mechanic of the Lehigh & Mahanoy R. R., the latter road being consolidated with the Lehigh Valley R. R., the year the engine was built. It was the first 2-8-0 type locomotive ever constructed and the name—"Consolidation" was given due to the consolidation of the two railroads and was not indicative of any special wheel arrangement. Mr. Mitchell's "*Consolidation*" established a type of freight locomotive for road service, that was subsequently introduced in practically all

parts of the world and locomotives of this type will still be found on many railroads.

The "*Anthracite*", built at South Easton, January, 1868, 4-4-0 type with 17x22" cylinders and 60" drivers. This was the first locomotive built at these shops.

The "*Bee*", built by E. S. Norris, Lancaster, Pa., in Sept. 1867. This engine was of the Decapod or 2-10-0 type with 20x26" cylinders, 48" drivers and weighed 97000 lbs. This engine and the "*Ant*" were built from specifications prepared by Alexander Mitchell. On account of their long rigid wheel bases they did not prove to be a success. They were subsequently rebuilt, the last pair of drivers was removed and a pair of trailing wheels substituted.

The "*Bee*", shown as a 2-8-2 type. The change increased the weight from 97000 to 108000 lbs. In 1889 the engine was again rebuilt as a 2-8-0 camel back with wide firebox weighing 126250 lbs. The engine continued in service until Feb. 1909. The sister engine, "*Ant*" had the first pair of drivers removed and a four wheel leading truck substituted for the two wheel truck thus making the engine of the 4-8-0 type. The new weight was 101696 lbs., the engine continuing in service until 1912. The changes were made at the Weatherly Shops.

The "*New York*", built at the Delano Shops in August, 1869. This engine was of the 2-6-0 type, 18x24" cyl., 61½" drivers and weighed 90600 lbs. The engine was rebuilt at Delano in 1886 and remained in service until 1902.

The "*Springville*", built by the Baldwin Locomotive Works in August, 1869. This was a freight locomotive of the 4-6-0 type, with 18x22" cylinders, 54" drivers and weighed 80304 lbs. The engine was scrapped prior to 1905.

The "*L. Chamberlain*", built at the Delano Shops, June, 1870. The locomotive was of the 2-6-0 type with 17x24" cyl., 61½" drivers. A second slide showed this engine as rebuilt, the picture taken sixteen years later.

The "*Jupiter*", built at the Hazleton Shops, January, 1870, of the 0-8-0 type with 20x24" cyl., 48" drivers and weighed 88000 lbs. Discarded in 1885.

The "*Leviathan*", built by William Mason, Taunton, Mass. in 1870. This engine was of unusual design. Our records are vague concerning the engine except that it originally belonged to the Utica, Ithaca & Elmira R. R.

(Editor's Note: The Mason records indicate this engine was built Feb. 1, 1875, construction #547 and was of the 0-6-6 type of bogie, described in our Bulletin #41. The U. I. & E. had a very steep grade near Ithaca on which a rack was built. The "*Leviathan*" had a gear on the main axle to engage with this rack. At the end of a trial period, the road was not convinced of the advantages of the bogie engine, she was returned to William Mason, rebuilt and sold December 26, 1876 to the Galveston, Harrisburg & San Antonio R. R. as the "*Commodore Garrison*." The "*Leviathan*" does not properly belong to the records of the Lehigh Valley R. R.)

The "*South Easton*", a 4-4-0 type of passenger engine built in the South Easton Shops, September, 1870, with 17x22" cylinders, 60" drivers and weighed 85120 lbs. Out of service prior to 1905.

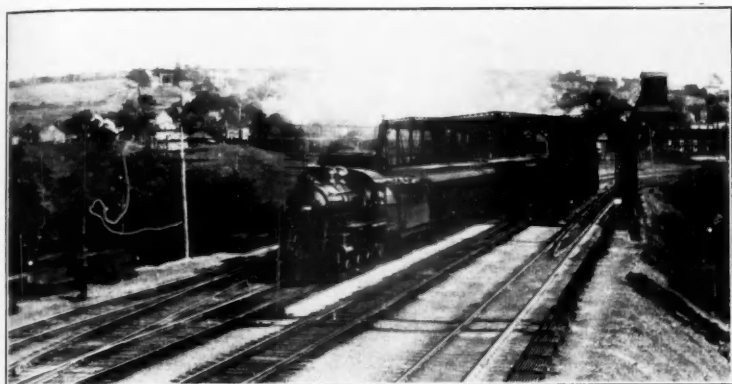
The "*Pittston*", built by Wm. Mason in September, 1870. A 4-6-0 type of engine for freight service with 17x24" cylinders, 48" drivers and weighed 76400 lbs.

The "*Janus*", built by Wm. Mason in August, 1871. Cylinders 15x22", drivers 44" and weighed 163520 lbs., a Fairlie of the 0-6-6-0 type intended for pusher service. This, in my opinion is one of the most radical designs ever introduced. The engine was first used in experimental service on railroads in the New England States and was purchased by the Lehigh Valley R. R. in 1873. It was put into service at Wilkes-Barre. In 1877 the engine was wrecked in a collision with the "*Tuscarora*" and was subsequently scrapped. This engine, so far as I can learn never gave much useful service. It has been a much photographed engine and perhaps one of its most useful missions has been to furnish contrast and give color to such exhibits as these. The boiler was later used at Perth Amboy, N. J. in a stationary plant on our railroad.

(Editor's Note: The failure of the "*Janus*" was due to lack of fuel and water capacity, but the design of having two boilers with their cylinders from one firebox has been amply demonstrated by the successful Mallet type of locomotives in service today. As to the fate of the "*Janus*," while its life in the vicinity of Wilkes-Barre was short, I am calling Mr. Bertram's attention to the following. The father of your Editor, while assembling his collection of locomotive photographs was informed that after the engine was removed from helper service, it was painted white and gold and assigned to the pay car. Not proving a success on that job, the engine was cut in two and two 0-6-0 shop switchers, saddle tanks, were made from the "*Janus*" and this Lehigh Valley man enclosed a print of L. V. #3260 as one part of the old "*Janus*." There was enough remaining on this locomotive for my father to identify it as one part of the "*Janus*." This matter is respectfully called to the attention of the officials of the Motive Power Dep't of the Lehigh Valley R. R., and while not authoritative, may be taken for what it is worth.)

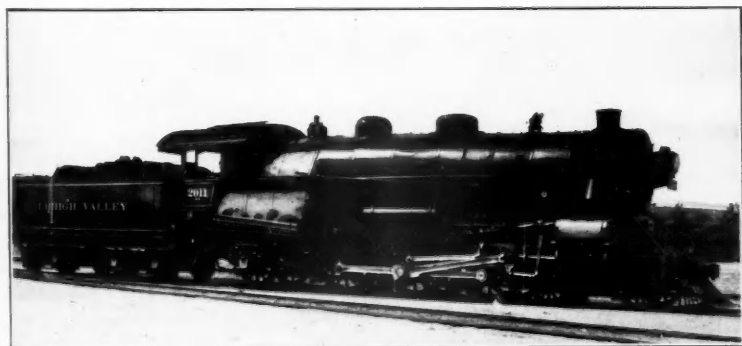
The "*United States*", built by the Baldwin Locomotive Works in 1876, 2-8-0 type, 20x24" cylinders, 49½" drivers. This engine had a somewhat larger boiler than on any previous "consolidation" type engine previously built and was exhibited at the Centennial held in Philadelphia in 1876 with a group of Baldwin engines. An excellent description of this engine, illustrated with sectional drawings was published in "*Engineering*" (London) and republished in the "*Railroad Gazette*" (New York), Dec. 1, 1876. The article stated that on a grade of 68 feet to the mile this engine hauled regularly 100 empty four wheel coal cars weighing collectively 340 tons at a speed of about 8 miles per hour; also on the Wilkes-Barre Mountain, having a grade of 95.7 feet per mile, this engine could haul 35 loaded cars, total weight of 329 tons at a speed of 12 miles per hour. Some of our present locomotives over the former grade are rated 1600 tons at speeds up to 30 miles an hour. The engine was rebuilt at Wilkes-Barre in 1892 with a wide firebox and a system of compounding was applied. This increased the weight to 125552 lbs. The engine was later changed to a simple engine and was scrapped in March, 1928 under road #598, Class M-18.

The "*Continental*", built by the Baldwin Locomotive Works in July, 1880, 2-8-0 type with 20x24" cylinders, 50" drivers and weighed 103840 lbs., 21200 lbs. tractive effort. This engine continued in service until 1917 and was classified as M-15.



Courtesy of Clinton T. Andrews.

L. V. 2001 on Train #10 at Coxton, Pa., hauled by one of the Mother Hubbard Pacifics.



Courtesy of Clinton T. Andrews.

L. V. 2011, K-3, Sayre Shops, 1913.



The "*Logan*", built at the Delano Shops in Feb. 1882, 2-8-0 type, 20x24" cylinders, 49 $\frac{1}{4}$ " drivers, weight 104340 lbs. Remained in service until Dec. 1909, classified as M-3.

The "*Dorothy*" built at Wilkes-Barre, May, 1884 for inspection service. Designed by Alexander Mitchell, of the 4-2-4 type, 11x20" cylinders, 56" drivers and weighed 77956 lbs. Remained in active service until 1934 and then sold to Mr. John B. Vaughn of Kingston, Pa. where it still may be viewed on his estate. A picturesque engine and one that carried many important personages!

The "*Potter*", built at Hazleton, May, 1884, 0-6-0 saddle tank, 14x18" cylinders, 33" drivers and weighed 52300 lbs. Our records indicate there were six engines of this type built between 1884 and 1891 and used around the coal docks at Perth Amboy. The last of these was scrapped in 1934.

The "*Duplex*", built at Wilkes-Barre, Pa., by Alexander Mitchell in Oct. 1886. A Mother Hubbard of the 4-6-2 type, with 20x24" cylinders, 62" drivers and weighed 137000 lbs. This engine was of radical design. The valve motion, cylinders and boilers were designed by Mr. George S. Strong of Philadelphia, Pa. The boiler had two fire chambers, each consisting of a corrugated steel flue, being joined at the forward end in a single combustion chamber. A description of this engine was published in the "Railway Mechanical Engineer" of October, 1887. It is stated that this was the most powerful passenger engine built up to that time and, as far as we can determine, it was the first "Pacific" type engine. We later tried the Strong patent valves on another engine, the #383, but this type of valve design was not continued.

The "*J. H. Wilhelm*", built at South Easton, Pa., July, 1888, a 4-4-0 with 19x24" cylinders, 62" drivers and weighed 78400 lbs. This engine is shown attached to the Pay Car—always a welcome sight on the railroad! The engine bears the name of the Paymaster who served in this capacity for many years. In those days the pay car was on the road the greater part of the time, as employees were paid in cash.

The #597, a 2-8-0 Mother Hubbard built by the Baldwin Locomotive Works in Oct. 1891, with 13x21x24" cyl., 50" drivers and weighed 124880 lbs. This was the first compound on our railroad, so our troubles were just starting. The engine was later simplified and was scrapped about 1924. You will note about this time, 1891, names on our locomotives gave way to numbers.

The #1373, a 4-6-0 Mother Hubbard built by the Baldwin Works, June, 1896, with 20x24" cyl., 63" drivers and weighed 143450 lbs. Later, rebuilt with 20x26" cyl. We had several of these engines which gave great satisfaction in freight service and of the same type we had 17 with 69" drivers that were used in regular passenger service for a number of years.

The #668, a 4-4-2 Mother Hubbard built by the Baldwin Works, 1896, with 19x26" cyl., 76 $\frac{1}{2}$ " drivers and weighed 140900 lbs. One of the first five "Atlantic" type passenger engines on our railroad. Tractive effort 18772 lbs., boiler pressure 180 lbs. Engines of this class pulled the "Black Diamond Express" when it was inaugurated in 1896. These engines continued in service until 1929.

The #673, a 4-4-2 Mother Hubbard, one of eight in a second group of "Atlantic" type passenger engines built by the Baldwin Works in 1900-01, cyl. 20x26", drivers 80½", boiler pressure 200 lbs., wt. 161480 lbs., tractive effort 22960 lbs. In 1906-07 the drivers were reduced to 77". These engines remained in service until 1928.

The #791, one of a group of ten 2-6-2 "Prairie" type, Mother Hubbard, built by the Baldwin Works, 1902-03-04, with 22x26" cyl., 76½" drivers, wt. 210700 lbs., 210 lbs. pressure. So far as we can determine these were the only 2-6-2 Mother Hubbards ever built. All of these engines were rebuilt to the 4-6-2 type about 1906 and the last was scrapped about 1923.

The #1225, one of 104 Vauclain compounds, 4-6-0 Mother Hubbard, built by the Baldwin Works between 1900-02 with 17&28x30" cyl., 63" drivers, wt. 211420 lbs., tractive effort 36885 lbs. One of these engines was exhibited at the Pan-American Exposition, Buffalo, N. Y., in 1901. They were all simplified in 1906-07 and had slide valves. They were superheated in 1914-16 with piston valves and Walschaert valve gear. Eleven of these engines are still in service and are used on our branch line freight service.

The #3442, an 0-6-0 Mother Hubbard type switcher, built at the Sayre Shops, October, 1913, with 20x24" cyl., 51" drivers, boiler pressure 180 lbs., wt. 127550 lbs., tractive effort 28800 lbs. There were 33 engines of this type, 8 being built by Baldwin from 1907-10; 25 being built at Sayre from 1911-14. Twelve of these engines are still in service.

The #222, a 2-8-2 "Mikado" Mother Hubbard, built by the Baldwin Works in 1903 with 22½x28" cyl., 56" drivers, wt. 234810 lbs., tractive effort 43031 lbs., 200 lbs. pressure. Ten additional engines of this type were built by Baldwin in 1906 and ten built by the American Locomotive Co. in 1907. These were the only 2-8-2 Mother Hubbards ever built so far as we know and all are now scrapped, the last one going in 1932.

The #1653, a 4-6-0 Mother Hubbard, Class J-55, with 21x28" cylinders, 69" drivers, wt. 207234 lbs., tractive effort 31183 lbs., boiler pressure 205 lbs. There were 105 of these engines, 54 built by the Baldwin Works and 51 by the American Locomotive Co., between 1904-1910.

The #1656, same class as the #1653 but showing them as rebuilt between 1916-24 with superheater, piston valves and Walschaert gear. Not all received piston valves, but some were equipped with the Universal valves which is a piston valve adapted to the slide valve seat. By this method the old type of cylinders may be retained. Three of these engines are still in service.

The #2006, one of eight 4-6-2 Mother Hubbard "Pacific" type built by the Baldwin Works in 1905-06. They were the only Mother Hubbard's of this type ever built so far as we can determine. They had 22x28" cylinders, 76½" drivers, weighed 241360 lbs., tractive effort 31621 lbs., 210 lbs. steam pressure. These engines remained in service until 1923.

The #2416, a 4-4-2 Mother Hubbard, Class F-3, with 20x26" cylinders, 77" drivers, weight 187200 lbs., tractive effort 22961 lbs., boiler



pressure 200 lbs. 17 of these engines were built by the Baldwin Works and the American Locomotive Co., between 1903-11. In service until 1929.

The #1808, a 4-6-0, Class J-57. An all purpose engine. Twenty of these engines were built in the Sayre Shops, 1911-12 with 21x28" cylinders, 69" drivers, wt. 202050 lbs., tractive effort 30422 lbs. Seven of these engines are still in service.

The #2479, a 4-4-2, Class F-6. One of 5 engines built at the Sayre Shops in 1910-11. Designed for passenger service with 21x26" cyl., 77" drivers, 200 lbs. pressure, wt. 196500 lbs., tractive effort 25312 lbs., they continued in service until 1930.

The #2035, a 4-6-2, Class K-3. Built for passenger service at the Sayre Shops, December, 1921, with 25x28" cyl., 77" drivers, wt. 271380 lbs., 215 lbs. boiler pressure, tractive effort 41534 lbs. There were a total of 41 of these engines having slight variations in width of firebox and were represented by Classes K-2; K-2½; K-3 and K-4, built in the Sayre Shops between 1913-1921. Forty of these engines are still in service.

The #2139, a 4-6-2, Class K-5½ "Pacific" for fast freight service. Fifty of these engines were built by the Baldwin Works in 1916-19 with 27x28" cyl., 73" drivers, 205 lbs. boiler pressure, wt. 311900 lbs., tractive effort 48723 lbs. Some of these engines were designated as Class K-5 on account of a slightly narrower firebox. All still in service.

The #2099, a 4-6-2, Class K-6 "Pacific" type passenger locomotive. One of 12 built by the Brooks plant of the American Locomotive Co. in 1924 with 25x28" cyl., 77" drivers, 215 lbs. boiler pressure, weight 291000 lbs., tractive effort 41534 lbs. These engines are equipped with the Franklin trailer booster and are used on the "Black Diamond Express" between Newark and Mauch Chunk and Coxton and Buffalo. All in service.

The #4059, a 2-10-2, Class R-1 "Santa Fe" type locomotive. One of 76 built by the Baldwin Works between 1917-19 with 29x32" cyl., 63" drivers, wt. 374100 lbs., boiler pressure 200 lbs., tractive effort 72620 lbs. Sixteen of these engines were sold to the Hocking Valley R. R. in 1920-22; twenty were changed to the class N-6, 2-8-2 "Mikado" type, in which the back pair of drivers were removed and the boiler shortened. Twenty-one of the remaining "Santa Fe" type engines were equipped with Bethlehem auxiliary locomotives under the tenders, increasing the tractive effort by 14400 lbs. These engines are used in heavy freight and hump yard service, most of them in the coal regions. On account of high maintenance costs, this class of engine was not entirely successful until after the adoption of floating hub liners and the advent of automatic force feed lubrication.

The #1163, a 4-6-0, Class J-25, one of 35 locomotives built in the Sayre Shops, 1917-18 for freight or passenger service on branch lines. Cylinders 20x24", drivers 63", weight 137000 lbs., 190 lbs. steam pressure, tractive effort 24609 lbs. All in service.

The #3054, an 0-8-0 Mother Hubbard, Class L-3 for switching service. Twenty of these engines built by the Baldwin Works and the

American Locomotive Co., 1905-08 with 21x28" cyl., 55½" drivers, 200 lbs. boiler pressure, wt. 174850 lbs., tractive effort 38823 lbs. Three of these engines are still in service.

The #294, a 2-8-2 "Mikado" Class N-6, rebuilt from Class R-1 engines. This conversion was made at Sayre Shops, 1928-29. These engines have 27x32" cyl., 63" drivers, boiler pressure 200 lbs., wt. 328360 lbs., tractive effort 63000 lbs. These engines are used in heavy freight service, mostly in hauling coal to tide water.

The #5005, one of six three cylinder 4-8-2 "Mountain" type engines, built by the American Locomotive Co. in 1924. Cyl. 25x28", 69" drivers, 200 lbs. boiler pressure, wt. 369000 lbs., tractive effort 64700 lbs. Used in passenger service over the mountains between Mauch Chunk and Coxton.

The #3188, an 0-8-0 switcher, Class L-5½, rebuilt from Class M-38, 2-8-0 type in the Sayre Shops from 1919-29, with 22x30" cyl., 55½" drivers, wt. 208935 lbs., tractive effort 45587 lbs., 205 lbs. boiler pressure. One of 35 engines, all in service.

The #333, a 2-8-2 Class N-2 "Mikado" type locomotive. Total of 42 now used in switching service. Built by the Baldwin Works in 1913 with 27x30" cyl., 56" drivers, wt. 322000 lbs., tractive effort 58092 lbs. All in service. We had 75 other engines built by Baldwin for freight service from 1913 to 1922. These were classes N-2½ and N-3, very similar to the N-2 class save that they have 63" drivers and tractive effort of 56083 lbs.

The #432, a 2-8-2 Class N-4 "Mikado" type engine. One of 20 engines built by the Baldwin Works in 1923 with 27x30" cyl., 63" drivers, wt. 326340 lbs., tractive effort 59000 lbs. These engines are equipped with Franklin trailer boosters.

The #492, a 2-8-2 Class N-5 "Mikado" type engine. One of 55 locomotives built by the American Locomotive Co., 1923-24 with 27x32" cyl., 63" drivers, 200 lbs. boiler pressure, wt. 325000 lbs., tractive effort 63000 lbs. Used in heavy freight service. Until recently, prior to the arrival of the Class T engines, the N-5 locomotives were used in fast freight service and a few of them are still retained in that service.

The #5101, a 4-8-4 Class T-1 "Wyoming" type locomotive. Built by the Baldwin Locomotive Works in 1932 with 27x30" cyl., 70" drivers, wt. 413170 lbs., tractive effort 66400 lbs., 250 lbs. steam pressure. Used in fast freight service. A total of 11 of these engines.

The #5206, a 4-8-4 Class T-2 "Wyoming" type locomotive. Built by the American Locomotive Co., 1932 with 26x32" cyl., 70" drivers, wt. 424000 lbs., tractive effort 66700 lbs., 225 lbs. boiler pressure. A total of 11 engines used in fast freight service. Both this and the Class T-1 engines were equipped with the Bethlehem auxiliary locomotive mounted on the six-wheel tender truck, which added 18000 lbs. tractive effort.

The #5126, a 4-8-4 Class T-3 "Wyoming" type locomotive. Built by the Baldwin Works in 1934, used in fast freight and passenger service. Cylinders 27x30", 77" drivers, wt. 435000 lbs., tractive effort 66500 lbs., 275 lbs. boiler pressure. Two of these engines were equipped with

Timken roller bearings. There are six engines in this class and they are used to handle our fast symbol trains such as NYB-1, a 13 hour freight train between Jersey City and Buffalo. They are also assigned to milk trains where fast service is required. The introduction of this class of locomotives in these services presented problems to be overcome that were entirely new in the field of locomotive engineering. They are capable of speeds up to 90 miles an hour. Only a few years ago a fifth morning delivery in New York of freight from Chicago constituted satisfactory service. Today we must meet a third morning delivery. The ever increasing demands of the shipping public for speed and dependability of service have made necessary locomotives such as our "T" classes.

### Conclusions

You have viewed pictures of the various types of locomotives used on our railroad and which mark one hundred years of development. From the very names given some of the earlier engines, such as the "Hercules", the "Leviathan" and the "Nonpareil", we are compelled to believe that each new type was thought to mark a new era and each new locomotive was the last word in power, speed and general locomotive design, even as we now view the class T-3 engines. Our past experience, therefore, would definitely lead us to believe there will be no interruption in the further development of the locomotive.

My experience in the mechanical department of railroads covers a period of only thirty years, yet, in that comparatively short period, I have witnessed the constant increase in size and weight of locomotives, higher boiler pressure and tractive forces; also I have witnessed the advent and subsequent development of the superheater, the stoker, the power reverse, boosters and all the many locomotive appliances, including vast improvements in the air brake. These improvements in locomotive appliances have been an important factor in making possible the marked progress the railroads have been able to make in this period of time. I feel that the field of development is still widely open to the alert mind of the future.

(Editor's Note: In presenting the above paper to our members, your Editor has taken the liberty of substituting "Mother Hubbard" type for that of "camelback" in Mr. Bertram's paper. In recent years certain of our journals have taken the liberty of calling the so called Wootten type engine with the additional cab perched in the middle of the boiler—a "camelback." This is incorrect. Students of locomotive history know that this name applies only to those locomotives built by Ross Winans of Baltimore and which saw service on the Baltimore & Ohio and a few other roads. These engines with their sloping crown sheets and their cabs perched atop their boiler were properly called "camelbacks" and as such they have always been known. They should not be confused with the engines built by Samuel J. Hayes, Master of Machinery of the B. & O. R. R., one of which was on exhibition at the "Fair of the Iron Horse" tho' the error is pardonable. In the years that your Editor lived in Pennsylvania and was in contact with the roads using the wide or Wootten firebox, these engines were called "Mother Hubbards." Just when, how or where, the name "camel" came to be applied to these engines, your Editor is unaware, but if we are to state names and types correctly, which I believe is our mission, the name "camelback" can properly be applied only to those early engines built by Ross Winans of Baltimore, Md.)

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In addition to the material indexed, the Society produced in 1936 two special bulletins without numerical assignment:

"Documents Tending to Prove the Superior Advantages of Railways and Steam-Carriages over Canal Navigation," by Col. John Stevens. Published in 1812. Fac-simile reprint.

"Locomotives of the Chicago, Burlington & Quincy R. R., 1904-1935, Part I."

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